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CONTENTS.

MEDICO-CHIRURGICAL JOURNAL.

⭐riginal Articles.

EXCESSIVE MENTAL EXCITEMENT, AND SOME OF ITS CONSEQUENCES. *The Inaugural Address given in October* 1893, *at the opening of Session* 1893–94 *of the Liverpool Medical Institution.* By the President, T. R. GLYNN, M.D., F.R.C.P., *Professor of the Practice of Medicine, University College, Liverpool; Physician, Liverpool Royal Infirmary.*

BY the term, excessive mental excitement, I mean intense or protracted excitement either in the department of the emotions or intellect. I propose more particularly to consider the weakness or irritability of the nervous system, which seems to be a characteristic of civilised man in the present age. In other words, I intend to limit myself to the study of what is commonly called nervous exhaustion, a condition which may be defined as fatigue by excess of function. I may remark that Charles Ferè's observations on the phenomena accompanying excitement and exhaustion of nerve centres, tend to give us a more precise notion of the modifications in the innervation of the organism that attend these conditions. His experiments in the physical concomitants of the emotions confirm the view of Bain with singular exactness. He has demonstrated that each time a nerve centre is awakened to action, it determines a diffusion of nervous energy through the entire organism, increasing general tonicity, reinforcing muscular power (as proved by testing the grip in the dynamometer), strengthening

A

the circulation and augmenting the size of the limbs, quicken-
ing the respiration and exciting the secretions; and that this
general excitement is after a while arrested, and the tonicity
is reduced to the normal, and in the case of over-excitement
to below the normal. A visual impression, especially when
produced by red rays of light, a strain of music, a noise, a
taste or odour—all have a certain dynamogenic power, that
is, they cause a diffusion of energy. The cerebral action accom-
panying attention or reasoning is also the point of departure of
excito-motor phenomena. Over-activity of the brain, or but
little activity of the organ in a direction to which an indi-
vidual is unaccustomed, is accompanied by, with the contrary
phenomena, lowering of tonicity, lessening of size of limbs, &c.
Fatigue, he demonstrates, is attended with mental and muscular
feebleness, and depression of all forms of vital activity. The
depressing emotions exert a most pernicious influence on the
vitality. To quote Burton's *Anatomy of Melancholy*—

> " For when the mind with violent terror shakes,
>   Of that disturbance, too, the soul partakes ;
>   Cold sweats bedew the limbs, the face looks pale,
>   The tongue begins to falter, speech to fail,
>   The ears are filled with noise, the eyes grow dim,
>   And deadly shakings seize on every limb."

Certain of Feré's observations afford a possible explanation of
the mode by which these depressing impressions predispose an
individual subjected to their dominion to infection. He found
that in rabbits kept in continual terror (they were systematically
teazed by lunatics at the Bicêtre Hospital), the peripheral blood-
vessels were maintained in a state of contraction, which formed
an obstacle to the immigration of leucocytes, and so allowed
the organisms in virulent cultures with which the animals were
inoculated to pass with ease into the circulation.

Pleasurable emotions, if prolonged, are followed by exhaustion,
and the degree of exhaustion varies according to the duration
and quality of the excitation, and according to the resistance
of the subject. Certain individuals are, as we say, particularly
excitable or nervous; this condition is hereditary or acquired.

They react too violently to sensations or emotions, nervous energy is too widely diffused, and exhaustion is quickly induced. Under the influence of recurring excitement a state of permanent weakness is set up.

I shall not occupy your time by enumerating the many and diverse disorders that may originate in mental strain, nor attempt to explain the nature of their relationship; such an enterprise would lead me into a wearisome discussion of many subtle points in the ætiology of disease.

When the nervous diathesis has been acquired in any way, the repetition or persistence of the causes that have induced it are likely to lead to the development of some more serious nervous disorder. When the diathesis is inherited, the predisposition necessarily exists.

The nervous individual is likely to suffer from headaches and neuralgias; a little extra fatigue will perhaps cause sleeplessness, or render him dyspeptic, and he will readily become a victim of that plague of modern life—neurasthenia. He will probably, during the progress of any acute febrile disease, manifest "cerebral symptoms"—delirium and prostration. In such an one, traumatisms, intoxications, general disorders, and mental shocks tend to lead to the development of serious nervous accidents, functional or organic. The taint of syphilis will, in him, probably produce locomotor ataxy; alcoholism will cause neuritis; a chill or draught, sciatica or facial paralysis. Influenza will very possibly give rise to a cerebral or spinal disorder; a slight shock or a railway accident will create a neurasthenia or hysteria; a commercial crisis, an insanity; overwork and dissipation, a general paralysis.

If there is any truth in these statements, it is our duty to study the causes that lead to the development of the nervous condition, that if possible their pernicious influence may be arrested. It is also incumbent on us to protect the neurotic as far as lies in our power from the special ills to which they are exposed; and if nervousness is a characteristic of the mental state of civilised man in our times, my subject is one of national importance as well as of professional interest.

It is so intimately involved in questions relating to the moral
and social conditions incidental to modern civilisation, that even
if I possessed the ability, I could not do justice to it in the time
at my disposal.

Mr Herbert Spencer, some years ago, directed attention " to
the accidents due to over-application."   " On old and young,"
he said, " the pressure of modern life puts increasing strain ; "
and he affirms that the health of parents suffers in consequence ;
that they " bequeath their damaged constitutions to their
children ; " and that " these comparatively feeble children, pre-
disposed to break down under ordinary strain, are required to
go through a curriculum much more extended than that pre-
scribed for the unenfeebled children of past generations." [1]

These statements gave rise to much wrangling, and general
attention was particularly directed to the possible evils of mental
pressure in schools.   Schoolmasters, literary men, scientists, and
physicians vigorously discussed the questions involved ; while
some contended that grave injuries were caused by mental
strain in school, others denied that such ills existed ; there was
negation on the one side, and exaggeration on the other ; for
the subject is an extremely complicated one, one on which it is
difficult to collect trustworthy data for logical treatment, one
that involves much that appeals to the emotions, and into which
prejudice and conjecture have entered too largely.   It is com-
paratively a simple matter to discover the amount of physical
injury a child may have sustained by injudicious training—to
establish the presence of a spinal curvature, a stoop, a contrac-
tion of the chest, or a myopia ; but it is not so easy to determine
the amount and character of any mental damage it may have
acquired during the same process.

It is not necessary for me to discuss this vexed question.   It
may be granted that acute troubles rarely result from over-pres-
sure in schools, but nevertheless a weak and irritable state of
the brain is too often produced, which betrays itself in an alter-
ation of the child's disposition and character, and which, like
the similar condition in the adult, predisposes to the develop-

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[1] *Education: Intellectual, Moral, and Physical,* by Herbert Spencer.

ment of neuroses, and is a source of misery to the subject of it years afterwards. Crichton Browne states that the results of over-pressure in schools may be altogether unnoticed, but may induce so unstable a condition of the nervous system, that some trivial ailment may lead to the genesis of so terrible a disease as acute dementia. Other writers have spoken of the tendency some school children exhibit to become delirious from slight causes.

Enforced sedentariness, poor food, and close rooms often co-operate with over-pressure in reducing the nervous energy of school children. It is impossible to overrate the importance of physical training in schools, but this also may be a source of exhaustion when pushed too far.

The child who has inherited a weak and nervous organisation, or who is a degenerate, is more likely to break down from injudicious management than others, and this should be recognised by teachers and doctors, and the necessary care exercised during the period of education. I have, however, no hesitation in stating that the discipline of a well-regulated school may prove of the greatest advantage to the nervous subject; that I have known headache and other neurotic troubles, which proved most obstinate whilst a child was under injudicious influence at home, disappear under school training.

Undoubtedly the regime of the ordinary " ladies " school is as pernicious as it is possible for any training to be. It is hurtful alike to mind and body. The capabilities of such seminaries in these directions are well set forth in the parody of the "Song of the Shirt," called the "Song of the School."

First verse—

> " With features weary and worn,
>   With eyelids heavy and red,
> A school-girl sat by her book-laden desk,
>   Painfully grasping her head ;
> Write, write, write,
>   Without rhyme or reason or rule,
> And still, oh the pitiful, pitiful sight !
>   She sang the ' Song of the School.'"

Last verse—

> " Learn, learn, learn,
>   No time for a romp or play.
> And what is the gain ? a lot of marks,
>   And a public prize, they say.
> In the oak-roofed hall with its polished floor,
>   And a noble lord in the chair,
> ' When on its walls my shadow falls
>   'Twill be scarcely visible there.' "

It is the older struggling and harassed student who is espe-
cially likely to suffer, the pupil-teacher, governess, schoolmaster
or mistress, who teach by day and study by night, and who are
haunted by fear of failure and loss of employment.   " In
Bethlem," says Savage, " we have a very large number of
governesses, and, to my mind, the governess's life is a very good
example of the predisposing causes of insanity as seen in action."

The adult seems to be more liable to break down under
mental strain than the child.   This tendency is due to the
exercise of his intellect in limited directions; the incidence of
worry, the abuse of stimulants, and the neglect of congenial
distraction and suitable physical exercise.

The child, as Charcot has pointed out, often escapes the ill-
effects of injudicious pressure by reason of circumstances in-
herent to its youth.   He observes: " The majority of children
are inert, and will not always respond to the incentive to work."
They are, as their teachers declare, inattentive, that is to say,
they are easily distracted by what is going on within and around
them.   Their labour is usually unassociated with protracted
anxiety, their troubles being soon forgotten.   " Those who do
apply themselves to work do not suffer, because their intellectual
efforts are compensated for in the satisfaction they find in suc-
cess."   Moreover, the young pupil, as soon as he escapes from
the enforced stillness of school, is prompted to take violent
exercise, and the romp in the slum or the game in the meadow
prove alike of inestimable benefit.

The nature of my theme constrains me now to dwell on
certain conditions of modern society which exercise a pernicious
influence on the individual and the race, and compels me to

leave unnoticed the compensating circumstances, which we trust will at length lead to the higher development of mankind.

It must be admitted that modern civilisation has led to an increase of the conditions that tend to produce our excitement, intellectual, moral, and sensorial.

Over-crowding, and its accompanying evils, is responsible for the development and diffusion of numerous disorders; but the ills attributable to these physical causes are hardly greater than those that are to be assigned to the psychical agencies with which I am concerned.   These agencies are always in operation in a civilised community; the greater the degree of civilisation, so long as it extends in its present lines, the greater their potency, the more general their influence.

We may indeed imagine that in some future age medical science shall be so complete, and medical art so triumphant, that all infectious disorders shall be exterminated.   But so long as man has the same appetites, so long as he is moved by the inordinate desire of wealth and by other passions, so long will he and his degenerate offspring suffer.   In this distant epoch the doctor will have occasion to exercise his art only upon degenerative and functional disorders; he will be called upon to treat over-used eyes, stomachs, and brains, the latter especially. In this millenium neuroses will abound; there will be hosts of specialists, plenty of lunatic and idiot asylums, also many homes for the blind, deaf, and dumb, as well as numerous retreats for dipsomaniacs.

I am concerned, however, with the realities of our own, and not with the possibilities of a future time, and have now briefly to review some of the conditions of modern life that are especially injurious to the nervous system.

Our age is an age of great excitement and hurry; if we may regard the coach, toiling from stage to stage, as an emblem of the "good old days," the locomotive and its fiery speed is the symbol of modern times; everywhere there is energy and haste, everywhere competition and worry.   Our age is an age of compulsory education, of books and newspapers, of numerous inventions and great undertakings.

A man at the middle period of life, in the present day, has seen more and done more, has tasted more pleasures and pains, and suffered greater vicissitudes, than an old man in a former generation. There are many ups and downs in modern life; fortunes are quickly made and lost; speculation, unrest, and inquietude have entered into the business of to-day. The traditions that formerly separated men into distinct classes, imposed bounds to their activity, restricted their appetites and desires, and constrained them to follow in the steps of their ancestors; they entered on the duties of life without hesitation, and pursued them with little effort. To-day these social distinctions are lessened; new possibilities of advancement, new roads to fortune are opened to the active and ambitious of every class; and as the number of those that press forward increases, the struggle for existence becomes keener, and the less gifted and weaker fall. Noise, glare, turmoil, and unsightliness abound, and keep the senses in constant tension.

These circumstances, and the abuse of tea, coffee, tobacco, and alcohol tend to cause nervous exhaustion. And as there are many who are not content to exist without physical stimulants, so there are others who are not satisfied to live without continual excitement. These are the folk who, in search of what they call change, hurry from place to place, or at most pause for a while at some noisy spa or watering-place. "It is ludicrously woeful," says Ruskin, "to see the luxurious inhabitants of London and Paris rushing over the continent, as they say, to see it; transforming every place, as far as in their power, into a likeness of Regent Street and the Rue de la Paix."[1]

I have referred to the use of stimulants, and there is ample evidence that their employment in many European countries has increased during the last twenty years. I quote from Mr Goschen's return to the House of Commons, April 1889.

In 1866 nearly 5 lbs. of tea were consumed per head	.	4·95
„ 1876 over 6 „ „ „	.	6·13
„ 1886 „ 6½ „ „ „	.	6·45
„ 1888 „ 6½ „ „ „	.	6·58

[1] Ruskin, "The Moral of Landscape," *Modern Painters*, vol. iii. chap. xvii.

Since 1888 the consumption of tea has especially increased; that of cocoa has also increased, and the consumption of spirits and wine increased until last year, since when there had been some diminution.

In 1856 about 1¼ (1·26) gallons of spirits per head were consumed.

„ 1866	„	1½ (1·45)	„	„	„
„ 1876	„	1¾ (1·83)	„	„	„
„ 1886	„	1¼ (1·32)	„	„	„
„ 1888	,,	1¼ (1·29)	„	„	„

Slight increase to 1891, and now some decline.

Beer.

1856	2·26 gallons.
1866	2·95 „
1876	3·34 „
1886	2·69 „
1888	2·68 „
1891	2·89 „

In 1890–91 excise and customs duty on alcohol is estimated at £31,585,270; 1891–92, at £32,278,770.

| Tobacco in 1856 | . | . | 1·16 lb., 1 lb. 2½ oz. per head. |
| „ 1888 | . | . | 1·48 „ 1 „ 8 „ „ |

In France the consumption of alcoholic beverages was in—

1853	.	.	.	.	1·09 litres per head.
1869	.	.	.	.	2·50 „
1873	.	.	.	.	2·84 „
1892	.	.	.	.	4·50 „

In America the consumption of alcoholic beverages has also increased. Comparing the amount in 1883 with the mean of the years 1876, 1877, 1878, there were 33·4 per cent. more brandy; 30·65 per cent. more wine; 77·81 per cent. more beer consumed.

Few can do without the stimulating cup of tea or coffee with the morning paper, and it is remarkable that tea and the newspaper appeared in company. In one of the earliest gazettes—the *Mercurius Politicus* for September 30, 1638— there appeared the following advertisement: "An excellent Chinese drink which is recommended by all physicians, and which is called in China 'tscha,' and by other people 'the' or 'thé,' is sold in London at the 'Sultan's Head,' near the Exchange."

A society that has become more and more weary of life demands newer sensations; extraordinary diversions; unnatural and blood-curdling situations in the novel and drama.

Contemporaneous music reflects the mental tendencies of the day, and the need for violent and fresh impressions. Extravagant and new-fangled harmonies, erudite ear-splitting noises of all kinds of instruments have replaced the stately measures, "the linked sweetness long drawn-out" of the grand old masters.

The novel affords admirable mental diversion, but the continual reading of novels, to which hosts of people are devoted, exercises a pernicious influence on mental development, and tends to produce nervous exhaustion; for the reader of the ordinary sensational story subjects himself for an hour or two to the most varied and profound emotions. Tissot says, "Allow your daughter to read novels at 15, and she will be hysterical at 20." The reading even of first-rate books may be hurtful, unless such reading is accompanied with the exercise of thought and the careful criticism of what is read; reading without intelligent analysis can lead to no expansion of the understanding. The individual who falls into such a habit is likely to be influenced (if influenced at all) by the last book he has perused, and will be superficial and changeable. Virchow and Westphal state that there has been in Germany of late years a diminution in the number of original thinkers, and that this is due to the prevailing habit of simple reading, unaccompanied with critical thought.

A writer, Mr Narling, in the *Westminster Review* of September 1893 (on "The Future of Society"), discussing modern failings, truly observes that "dancing, which in the days of our grandparents was a graceful and refined amusement, has degenerated, through the vulgar, hurried, and impatient tone of the day, into a romp." "There is no time in this high-pressure age for coining speeches or words; speech is ejected in jerks, like the steam that propels our engines; conversation is no longer an art, but a conveyance of crude, half-digested notions and interrupted thoughts." Manacéine (*Le Surmenage mental*) observes

that the pursuit of pleasures and distractions is the sole aim of certain persons, and their condition can only be explained by the impoverished state of their minds; a man with a normal nervous system has no need of violent psychical impressions in order that he may live and think." A healthy man finds in himself the energy he requires in the struggle for existence, not only against the unfavourable conditions which surround him, but also against the low and egotistical tendencies which may arise within him; in this conflict his will is strengthened and the better side of his character is developed. Whereas the individual with a feeble and ill-nourished brain is easily exhausted under similar circumstances, and, in consequence, before long contributes to swell the number of those persons who are bankrupt of mental and bodily strength. An exhausted brain is unstable in its action, and, owing to this instability, its various centres are incapable of strictly co-ordinate activity; an exhausted brain is easily excited, but as easily fatigued, hence the need of artificial excitants. Moreover, an unstable nervous system is distinguished by its tendency to enter into partial action; so that, for example, certain ideas may come to dominate all others; hence psychopathic subjects are liable to irresistible impulses and desires, illustrated in cases of *folie du doutè*, to which disorder they are just as liable as the degenerate are. One of our overworked business men in Liverpool consulted me for an affection which greatly alarmed him. After an altercation with an acquaintance, he attended a meeting of the directors of a certain company, and found he could not sign his name. He excused himself, and returned to his office, and there he wrote many letters. The next day he visited the directors' room again by himself, and again failed to write his name. Agoraphobia is also common in these nervous subjects.

The majority of persons nowadays come under the influence of town life, and in these great centres are gathered together all possible causes of excessive excitement—intellectual, emotional, and sensorial—that can fatigue, by their multiplicity and repetition, and thus predispose to nervous exhaustion.

Our age is characterised by migration from country to town,

and cities abound. With prospects of higher wages and of greater ease and enjoyment, labourers in every field enter the towns to engage on a fiercer struggle for existence, and frequently meet with more privations and more temptations; some survive, and, indeed, often make the best citizens, but some lose their health and succumb, and their degenerate children enter on life less fitted for its duties than their fathers. Towns, said Jean Jacques Rousseau, engulf the human race; at the end of some generations the dwellers in towns degenerate and perish. Galton and others have observed that degeneration and extinction of the inhabitants of cities are normal phenomena. The degradation of the organism particularly favours the development of nervous diseases, for the pernicious influence which the injurious hygienic conditions of town life exert on the health of town-folk is not exercised indifferently on all organs, but chiefly on those which offer the least resistance—that is to say, on the cerebro-spinal system.

Towns influence the race in another way; they attract the ambitious, energetic, and intelligent. The efficacy of this form of selection is increased by the marriage of citizens similarly endowed, so that these mental qualities become exaggerated in the offspring; but this refinement renders the brain more delicate and vulnerable, especially in association with impaired physical health.

Thus it is that in all large towns the most varied and grave diseases of the nervous system abound in proportion as the diverse causes of mental fatigue are developed. Organic diseases of the nervous system are more common in urban than in rural districts. In London, for instance, such affections are five times more frequent than in all England taken together (Levillain). Tubercular disease of the lungs is 23 per cent. more frequent in London than in all England, while tubercular meningitis is 64 per cent. more common; hence it is to be concluded—Jacobi (Cullere, *Nervosisnine et Nervoses*, 104)—that the deleterious influences of vitiated air and unhealthy surroundings, fatal as they are, are nevertheless more than three times less hurtful to the lungs than the pathogenic influence of the moral conditions

of city life are to the brain. General paralysis has during the last half century become a very common disease, and appears to be met with at an earlier age than it was some years ago. Cullere states that one quarter of the insane persons admitted into the French asylums from large towns suffer from the affection. It attacks artists, literary men, politicians, and other brain-workers especially. Contesse found that at the Bicêtre the liberal professions furnished 38 per cent. of the general paralytics. The disorder, too, is more commonly met with in the lower orders, and prevails among them as the struggle for existence and the abuse of stimulants increase. Simple insanity is specially met with in urban and also in certain country places where, from the poverty of the district, want and worry prevail. Dr Bevan Lewis ("Origins of Crime," *Fortnightly Review*, September 1893), observes: "Insanity would appear to attach itself more readily to those communities where the poverty of the people is in itself a bar to intemperate habits. Want, anxiety, and moral agencies generally play a large but incalculable part in the production of insanity. Alcohol plays, perhaps, a far less important rôle in the evolution of the simple forms of insanity than it does in the production of the degenerate criminal, and the explosive and impulsive varieties of the affection—epileptic conditions. Manacéine remarks that since the year 1850 articles are to be found devoted to the description of different kinds of insanity in children, whilst Esquirol, who had occasion to note 20,000 cases of lunacy, did not allude to any such forms. Idiocy and dementia have always been noticed in children, but not till recently the existence of mental disorders parallel to mania and melancholia.

Insanity appears to be on the increase in Europe and America.

The Commissioners in Lunacy report the proportion of total lunatics to the population to be, in 1890, 1 in 341. In 1845, when Commissioners came into office, the number was 1 in 800.

In 1860 there were 38,000 lunatics in England and Wales.
,, 1880 ,, 61,000 ,, ,,
,, 1890 ,, 75,000 ,, ,,

In Ireland—

In 1851 there was 1 lunatic to every 657 of the population.
„ 1871   „   1   „   „   328   „   „
„ 1891   „   1   „   „   222   „   „

In America, the Massachusetts Lunacy Commissioners report
that in their State in

1870 there was 1 lunatic to every 743 of the population.
1870–1880   „   1   „   „   570   „   „
1880–1890   „   1   „   „   480   „   „

I do not forget that these figures are somewhat misleading, on
account of more careful enumeration and other circumstances
affecting the returns from asylums in recent years; at the same
time, I fear that there can be little doubt but that insanity has
increased.

It is stated that during the last few years cases of what the
French call " folie à deux," that is, cases in which the insane
have inspired others about them with their disordered ideas, are
more commonly noticed.

Suicide, whatever the degree of will that presides over its
execution, whatever be the determining cause—pain, grief,
despair, irresistible impulse, or delusion—is manifestly the ex-
pression of a neurotic condition. It has been shown that in
France the number of cases of suicide increase in proportion
as the large cities are approached. Cullere states that suicide
is three times more frequent in town than country districts.
In country districts the number of suicides is 1 in 1,200,000 ;
town, 1 in 400,000. The suicides in Paris form one-seventh of
the suicides of the whole of France. The part of the Seine
which runs through this city engulfs more victims in a single
month than all the rest of the river in a year.

Self-murder seems to be generally more frequent.

In France the annual number has in forty years been tripled.
In France—

In 1827 the number of suicides is represented by 4·81 in 10,000.
„ 1830   „   „   „   5   „
„ 1840   „   „   „   8·1   „
„ 1850   „   „   „ ·   10   „
„ 1874   „   „   „   15   „

In Prussia, Bavaria, Belgium, Italy, Denmark, and Russia a similar increase in the number of suicides is noted.

In England in 1851–60 there were 65 suicides to one million.

„	1871–77	„	67	„	„
„	1885–87	„	80	„	„
„	1892	„	71	„	„

Fred. Hoffman (in *Arena*, May 1893), "On Suicide and Modern Civilisation," demonstrates that suicide is on the increase in America. I quote the statistics he gives exemplifying this fact in the case of New York.

In this city during the five years—

1871–75	there was 1	suicide to	208	deaths.
1876–80	„	1	„	201	„
1881–85	„	1	„	188	„
1885–90	„	1	„	165	„

In Philadelphia, Boston, Baltimore, Cincinnati, a similar augmentation in the number of suicides is recorded.

Hoffman also shows that there has been a frightful increase in the number of deaths from brain disease in America during the last twenty years. During the five years 1861–65 the deaths from brain disease were 8468 ; ratio to mortality, 15·3 : 1886–96, 21,325 ; ratio to mortality, 9·6.

In 1880 Morselli proved, from the figures furnished by Dr Farr's reports, that morbid conditions of the brain (apoplexy, chorea, paralysis, insanity) and suicide increased at a uniform rate.

A large proportion, then, of the inhabitants of towns become nervous, and suffer sooner or later from diverse neuro- or psycho-pathics (nervous irritability, neuralgia, megrim, neurasthenia, and hysteria). Certain forms, indeed, of this last disease —the severe types of hysteria in the male—are almost only seen in large cities.

Another condition—viz., anæmia—is, according to many physicians, associated with the nervous irritability which characterises our age. It is quite possible that while the present generation suffers from nervous weakness and anæmia, their forefathers suffered from plethora; and though bleeding was

abused by the old physicians, it was a more useful remedy, and capable of wider application, in their day than it is in ours.   The bleedings which were invariably resorted to in certain disorders, as in pneumonia, for example, are now replaced by tonics and stimulants, or by an expectant or palliative line of treatment.   This modification does not appear to have been attended by any marked diminution of mortality; indeed, according to Dr Barri, the death-rate from pneumonia in the Marie Hospital, St Petersburg, was rather lower under the old treatment by venesection than under the new régime.   But it does not follow that a return to venesection would give a lower rate of mortality in this disease.   On the contrary, there is reason to suppose that such a change would have an opposite effect.

It is quite likely that the abandonment of bleeding has been due not so much to fashion or to any modification of our ideas of the nature of disease, as to a change in the constitutions of the majority of men.   We cannot imagine that acute observers like John Hunter and Marshall Hall would have practised bleeding had they not found that it was usually a beneficial procedure, nor is it likely that physicians at a later day would have given up the use of the lancet if they had not been convinced that venesection was unsuited to the general type of the disease they encountered.

The ancients held that the blood tempered the brain, and in this archaic physiology there is the germ of truth, for an ill-nourished brain is a weak and irritable brain.   There are no patients so liable to hysteria as the anæmic or chloro-anæmic.   In my experience, about four out of five of the latter are hysterical and subject to all manner of nervous troubles.

The Materia Medica of our day is peculiarly rich in the number of anodynes and sedatives it affords.   We are compelled largely to avail ourselves of these agents, and also freely to administer stimulants and tonics.

It appears, then, that while in the present day great calls are made on the energies of various members of the civilised communities, the standard of health is low, and characterised

by nervous weakness and anæmia. The cause of this unfavourable modification is to be attributed to social and other conditions incidental to modern civilisation. Nervousness is not the monopoly of this generation. In the middle ages, terrible neuroses, the outcome of the gloomy religion and superstition of the time, prevailed epidemically. Nervousness nowadays is more general, and has a different origin. In all ranks of society, the disastrous effects of mental strain or of fatigue are to be found. With the lower classes existence is often precarious, and the pernicious influence of worry and hard work are combined. The commercial classes are subject to the anxiety and excitement associated with the fluctuations of the markets—to the mental strain accompanying the management of large sums of money. The artist and literary man has to use his brush and pen, though care may have chilled all inspiration. And those that "live in the gloved and essenced leisure," that know no toil but in amusement, grow weary in their aimless existence. In all, the ill effects of exhaustion are frequently increased by the abuse of alcohol and other stimulants.

The perfectly healthy man should hardly be conscious of physical or mental fatigue; a day of congenial work should close with voluptuous contentment. But the man who is deficient in nervous energy readily becomes painfully tired; he has, indeed, attacks of temporary neurasthenia, with its depression, pains, and dyspepsia. At the end of a day's toil or care he can no longer collect energy, or concentrate attention for further occupation; he goes to bed, but probably cannot sleep; his mind is now hopelessly active; or perhaps he sleeps, but wakens in the early morning in a state bordering on melancholia, miserably depressed, and filled with dark forebodings. In an hour or two the dejection passes off, but as he becomes more truly neurasthenic, it is more persistent. When these accidents are frequently repeated, genuine neurasthenia is developed, and all the miseries I have described become aggravated and fasten on the victim with almost hopeless obstinacy. This is a serious catastrophe; for the disease not only renders life a burden, but may terminate in graver mental disorders, melan-

cholia or mania, or lead to suicide. Moreover, like all the
neuroses, neurasthenia is transmitted by consanguinity; and
when it once enters a family, may taint the whole genealogical
tree, producing as plague-stricken and evil a brood as Zola
describes in his genealogy of the family, "Rougon Macquart"
(Le Docteur Pascal). Levillain states that if one parent is
neurasthenic the affection may be lost or attenuated in the
descendants. If both parents are neurasthenic, or one neuras-
thenic and the other hysterical, and if the series of alliances
between neurotic subjects is continued, the gravest nervous dis-
orders are developed, and the family comes to an end in utter
mental and physical degeneracy and dies out. Dejerin says,
neuroses of ever increasing gravity can be traced through
various generations, as the effects of heredity accumulate through
consanguineous marriage of neuropathics (Dr Levillain, *Hygiène
des Gens Nerveux*).

Decadence is progressively more marked in each generation
(Morel).

    A. The nervous, irritable, and excitable.

    B. The hysterical, neurasthenic, and hypochondriacal.

    C. The insane.

    D. Idiots, imbecile, sterile.

Nervousness betrays itself by different symptoms, the diversity
in different individuals being due to variations in the character
of those affected. Some persons become abnormally irritable
in temper, use a "big, big D" on small provocation. They
speak hurriedly and disconnectedly, often unnecessarily employ-
ing superlatives; their glance is quick and eager, their move-
ments restless, their memory treacherous, and their capacity
for protracted mental effort poor. Their writing (Manacéine) is
characterised by a tendency to the repetition of certain words,
especially verbs and adverbs. The nervous man enters your
consulting-room in a hurry, addresses you before the door is
closed, sits down in the wrong place, glares about him as if he
anticipated an earthquake, whistles or hums tunelessly when he
is requested to strip; misplaces his tie or studs, drops his money,
leaves you, returns, and says he has forgotten something.

In another form the subject is dull and apathetic, indifferent to things which ordinarily would move him ; he has, perhaps, some feeling of fulness in the head on slight effort ; he speaks slowly, and sometimes finds a difficulty in recalling a word he wants to use; in writing he does not accidentally repeat words, but occasionally omits terminal syllables, or leaves out words, and especially nouns.   Correspondence is accomplished with greater effort than usual; sleep is very often sound, but unrefreshing; and he awakens with heavy head and tired limbs, congested face, and sluggish pupils.   Such a man is likely to be peculiarly introspective, and will weary you with minute details of his numerous and various disquieting sensations.

The methods introduced for the measurement of the time occupied in certain mental processes have proved of value in the study of mental fatigue.   In the case of children of about six years, the sight of a familiar object excites only about two or three associated ideas, and the intervals of time which separate these groups are of about two minutes' duration.   With intelligent adults, a much greater number of ideas are developed at a much shorter interval—from four to forty seconds.   Physical, and more especially mental, exhaustion very notably limits the number of ideas awakened and retards the speed of their association ; any one, therefore, who is suffering from mental fatigue, or neurasthenia, becomes habituated to content himself with the associations that are at first presented to his mind, and these being limited, his judgments are in consequence superficial and narrow.

Brain work should be beneficial, but only on condition that the exercise of the organ is uniform and general, and not limited in certain directions.   Under the latter circumstances, development, or due nutrition, are arrested, and functional equilibrium is disturbed.   Maudsley, speaking of those whose mental habit is characterised by the passion of getting rich, observes : " The exclusiveness in their lives' aim and occupation too often saps the moral and altruistic element in their nature ; makes them egotistic and unsympathetic ; deteriorates the nature of their humanity."   Such persons " are, by reason of

this modification of their being, liable to insanity, and usually beget degenerate offspring." He observes: " In several instances in which the father has toiled upwards from poverty to vast wealth in the hope and aim of founding a family, I have witnessed the results in a degeneracy—mental and physical—of his offspring."

Monotonous work is injurious, for it is necessarily uninteresting, and this kind of mental exercise becomes the more hurtful when it does not admit of being automatically carried on, as much monotonous work may be. Clerks, accountants, and others suffer from this form of employment. Work that requires close and vigorous attention is exhausting, and likely to prove hurtful if excessive.

The man who loves his work for its own sake, who does not too devoutly worship what Ruskin calls the modern "goddess of getting on," " the Athena of the market" (*Selections from Ruskin*, second series, p. 54), is not likely to suffer in his labour; he knows that it is easier to rust out than wear out, and in the conscientious discharge of his duties, and in the due regard for his physical condition, he is likely to find happiness: further than this, in proportion as he is absorbed in his occupation is he less likely to fall a victim to the trials of life.

" Consider," says Carlyle, " how, even in the meanest sorts of labour, the whole soul of man is composed into a kind of real harmony ; the instant he sets himself to work, doubt, desire, sorrow, remorse, indignation, and despair itself—all these like hell-dogs ·lie beleaguering the soul of the poor day-worker, as of every man; but he bends himself against his task, and all these shrink murmuring off into their caves; the man is now a man, the blessed glow of labour is on him." [1]

Depressing emotions far more frequently prove hurtful than excessive intellectual exercise, and the latter becomes the more dangerous when it is associated with business embarrassments or domestic grief. The man whose occupation is monotonous should especially cultivate pursuits outside his business, and study to preserve his youthful enthusiasm for athletic games.

[1] Carlyle, *Labour: Past and Present.*

One of the signs of the times that seems to be of happy augury is the more general recognition of the value of physical exercise, and the enthusiasm with which sports are followed by old and young.

The subject of nervous exhaustion is not likely to see a medical adviser until he is becoming neurasthenic, and has commenced to take a melancholy interest in his organism—to study his digestion, to talk of his liver, and to watch his bowels. His doctor's first care should be to consider, not what shall I prescribe, but how is this man's mode of life to be modified for his good. The patient may be inclined to be sleepless, but he must not be dosed with bromides and chloral; dyspeptic, but he does not require papain and pepsine, or hepatic excitants, iridin and euonymin; weakly, but he does not need quinine and alcohol —the latter is especially dangerous, for the feeble and neurasthenic are apt to abuse the use of stimulants, and to become dipsomaniacs, and also to acquire the morphia and chloral habits. The patient's ideas of exercise will probably be limited to the aimless constitutional walk, or the mild aperient pill. I do not know which form of relaxation is the most inane. The saddle, the gun, the fishing-rod, the cycle, the golf-club are the remedies he needs. He may not require less work, but more work, mental and physical, in a different direction.

I will close with a quotation from the excellent Burton (*Anatomy of Melancholy*), who says, " A wise and honest physician will not administer medicine except in cases of absolute necessity, but will try the effect of diet, and the *vis medicatrix naturæ*, before he proceeds to exhibit the potency of his art. . . . . Melancholy is a disorder of the mind, to the cure and alleviation of which nothing is more essential than the kind offices of a friend."

EXCESSIVE INFANT MORTALITY IN LIVERPOOL, AND ITS PREVENTION. By HUGH R. JONES, M.A., M.D., *Honorary Assistant Surgeon to the Infirmary for Children;* and HERBERT E. DAVIES, M.A., B.Sc.[1]

WE are too apt to lose sight of the real in our pursuit of the ideal. Too often we knock our sublime heads against the stars and fail to see the mud and degradation at our feet; and by so doing, we cultivate a habit of mind which bitterly resents the rude blows dealt against our sensitive natures by the primitive savagery of uncultured man. We shut ourselves up in an intellectual solitude and construct philosophical theories of life and conduct which omit such ugly factors as lust and cruelty and murder! We have been told that philosophy has no concern with such utterly commonplace things as child insurance and child murder. But we have preferred to believe that philosophy has a wider scope, and that this society will not deem unworthy of its acceptance an attempt to throw light on the causes of the waste of child life which has made this city notorious. For this reason we offer no apology for introducing such a subject. Having investigated it, we feel none is required. Social questions are now the questions of the hour, and what is this but a social question? It is closely bound up with many of the most widely discussed questions of the day. The labour problem bears upon it, because the rise and fall of wages has a direct influence on the rise and fall of the infant death-rate, to take one illustration. Again, how are we competent to legislate for, and teach and discuss habits of thrift when we have prejudices and wrong ideas concerning the favourite form of thrift among the working-classes. We refer to child insurance. Education also is the subject of endless discussion. Yet what can be more absurdly inefficient than the system of education which leaves the learner entirely ignorant of those simple rules of conduct and of hygiene by which alone health can be conserved, which

leaves ignorant girls to grow up into ignorant mothers, who gain what little knowledge they eventually acquire at the expense of the lives of their unfortunate children.

Naturally, the state has concerned itself for a long time past with the protection of young children, but it is interesting to note that the tendency has been to consider the older children first, and gradually to care for younger children : it is only recently that the state has shown any interest in the most helpless of all—in infants, and as yet its care for them is only slight. Some may regard it as a bad thing for the state to place itself *in loco parentis.* Its interference may certainly be pushed too far ; but seeing that the tendency of recent legislation is undoubtedly socialistic, and is likely to be more so in the future, we cannot object to the state giving part of its care and attention to children whose own parents are not sensible of their duties and responsibilities.

The first measure which directly affected children was the famous poor-law of 1601, which provided for the support of children by their parents or grandparents, and in their default it established a system of child apprenticeship. At a later period protection was afforded to these apprentices against cruelty and ill-usage by their masters. The age of apprenticeship to chimney-sweeping was raised in 1788 to 8 years, subsequently to 10 years, and then to 16 years. The various Factory Acts passed during the present century show increasing care for young children. They provide for the clothing and education of apprentices ; and they restrict the hours of labour, and raise the minimum age at which children may be employed. The Baby Farming Act of 1871 was the first measure which directly affected infants. Since that time, more particularly during the past ten years, there has been much discussion and writing on the subject of the protection of infant life, and it seems as if the people of England were at last awakening to a sense of duty towards the very young and helpless.

Before proceeding to the detailed consideration of infant mortality in Liverpool, a few definitions and explanations are necessary. Whenever we speak of Liverpool without any

qualification, we shall mean municipal Liverpool. The registration district of Liverpool is not co-extensive with municipal Liverpool, and will be referred to as Liverpool district. Every statement, which is not of personal opinion merely, rests on a basis of figures extracted from official records—the returns of the Registrar-General, blue-books, police reports, and other sources. We have, as far as was possible, started with no theories we wished to prove: we have taken the figures as we found them, and shall honestly try to lay before you the facts they demonstrate. We may frankly own that in more than one instance the deduction eventually drawn was diametrically opposite to the one expected.

By infants we mean, throughout, children under one year of age. This species lends itself to scientific investigation more readily than the legal infant. In many investigations of this kind, all children under 5 years of age are included, but many errors are avoided by considering, as we have done, only those under 1 year of age. The subject is also narrowed to manageable limits.

The figures we shall quote are calculated in the following manner. Absolute numbers are not given; for example, we shall not say that 174 infants were suffocated in bed in Liverpool in 1890, but that of every 1000 children born in Liverpool in 1890, 9 were suffocated in bed. In other words, children were suffocated in Liverpool in 1890 at the rate of 9 per 1000 births; and so for other causes of death.

We are thus able to compare Liverpool with other towns, or with the whole of England. Again, since many fallacies are involved in considering a short space of time, the shortest period which we investigate is ten years, and most of our results are based on the returns for the decades 1871–80 and 1881–90.

The infant mortality for the whole of England, 1881–90, was 142 per 1000 births; that is to say, out of every 1000 children born, 142 died before they reached the age of one year. The rate in Liverpool during the same period was 183, being an excess of 41 per 1000 births. The average number of children born annually in Liverpool exceeded 19,000, so that more than

7700 infants died in those ten years, who would have lived if they had enjoyed the average chance of life which prevails throughout all England and Wales. The slaughter of the innocents by Herod, about which so much is heard, was a very small affair compared with this wholesale sacrifice, while on the whole his method was more humane than those which kill these victims of civilisation.

It is interesting to note that in 1891 the rate of infant mortality in Liverpool varies from 119 in Rodney and Abercromby Wards to 264 in Vauxhall Ward. It may be objected that it is unfair to pick out comparatively small districts like these, and that in all these considerations we ought to include the healthy suburbs; but the evil would still exist, though its intensity would be hidden, and we think that the influence of local conditions should receive careful attention. As Sir John Simon says (writing on this subject), "Local excesses of fatality are due to local circumstances of aggravation; these aggravating circumstances are such as it is fully possible to counteract; and that of the total mortality ascribed to these influences in England a very large share is preventable."

It is obvious from what we have said that infant mortality in Liverpool is excessive. The causes of this excess for Liverpool District, 1871–80, is shown by the following statistics compiled from the Registrar-General's Returns per 1000 living under one year of age :—

Under 1 Year of Age.	All England.	Liverpool District.	West Derby.
Zymotics, excluding diarrhœa,	13·33	24·15	16·69
Diarrhœa, ...	19·82	36·73	26·18
Tubercular, . . .	11·61	11·98	13·03
Nervous, ...	30·86	41·82	29·31
Respiratory, . . .	31·79	50·43	35·13
Digestive, ...	4·34	5·39	5·54
Violence, ...	2·63	17·65	6·53
Others, ...	62·67	83·9	56·56

The rate of infant mortality for Liverpool District was 217, and for West Derby 161.

The excess is seen to be due to zymotic diseases (by which are meant various epidemic and contagious diseases), to diseases of the respiratory organs, to diarrhœa (with which must be associated atrophy, debility, and privation, which account for the vast majority of deaths from ill-defined causes), and lastly to violence. To the excess from nervous diseases we shall refer again.

The following table is drawn from the Registrar-General's Returns, 1875.

Annual Mortality at each Month of Age.

Age in Months.	Healthy Districts.	England, Large Towns.	Liverpool.
0	447	571	672
1	145	218	316
2	102	157	226
3	87	131	209
4	81	126	205
5	75	120	203
6	70	115	204
7	65	109	209
8	61	105	216
9	58	100	227
10	55	95	241
11	52	91	260

It will be seen that the diseases which cause the excess are most likely to be prevalent among the poorer classes, and their prevalence is due to causes which are intimately dependent on poverty and other social conditions. Indeed, we may ascribe the excessive mortality from zymotics to density of population; excess in lung diseases to overcrowding and its attendant insanitary conditions; diarrhœa, atrophy, debility, and privation to improper feeding, ignorance, and neglect; while violence explains itself.

We propose to take these causes in turn, to investigate them, and to consider how far improvement is possible.

We need not discuss the question of overcrowding and insanitation at any length. Liverpool is notoriously the most over-

crowded city in England, the population numbering 99 per acre, or 115 if we exclude the docks. Mr Clement Dunscombe, the late city engineer, giving evidence before the Royal Commission on the Housing of the Working-Classes in 1885, said 70,000 people in Liverpool had still to be housed in healthy dwellings.

The authorities have been hitherto fully sensible of their responsibilities, and the sanitary condition of Liverpool has been steadily improving; but it is a matter of regret that progress with this work should be even temporarily delayed.[1]

It must be definitely understood that density of population *per se* has no injurious effect upon health. It is the conditions inevitably associated with this density that do harm, together with the increased risk of disease in infectious outbreaks. Density of population connotes dirt, bad ventilation, poverty, intemperance, and other ills; by these conditions health is affected.

One very important point must not be overlooked. There has been in the past, and there still exists, a widespread conviction that the cure for overcrowding is to demolish insanitary property, and to build on the site huge blocks of so-called model dwellings. This is a grave mistake. Intelligent observers have for some time past been attacking this plan, and a study of statistics shows that they are right.

Taking into account all the circumstances of the case, the general mortality in these dwellings remains too high, though it is true that the mortality at Nash Grove has been reduced one-half.

In a paper in a recent number of the *Contemporary Review* ("The Rise of the Suburbs," S. J. Low, Oct. 1891), it is said that "Philanthropic Societies and Local Authorities busy themselves impeding the lateral expansion of the towns while trying to heap still higher the contents of the filled and loaded central districts where men live in layers one on the top of the other. Great blocks of workmen's dwellings are built on the sites which in a few years would, in the natural course of things, be much more

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[1] At a meeting of the City Council in February it was resolved to instruct the Insanitary Property Committee to postpone the consideration of further improvement schemes.

profitably occupied by shops, warehouses, or factories, and artisans are encouraged and rewarded to bring up their young children in these barrack-like and prison-like tenements. The absurdity reaches its climax when we find County Councils proposing to pull down slums by the acre only to fill up the ground at enormous expense to the ratepayers with fresh sets of expensive dwellings for the labouring classes, whom it is thus sought to anchor to the congested districts of the great cities. It is a mistake, and a wasteful one."

The remedy which he proposes, and which we think is the only remedy for overcrowding, is the excellent plan now being largely adopted in London and elsewhere of cheap workmen's trains, which enable them to be within easy reach of work and yet live where land is sufficiently cheap for each man's house to be self-contained.

We have already referred to the association between over-crowding and diseases of the lungs. In 1847 Mr Balman, in a paper read before the Literary and Philosophical Society on the subject of infant mortality, traced the excess to the influence of cold. There is no doubt that exposure to cold and deficient clothing are factors, but the influence of badly-ventilated rooms and of cellar-dwellings, for which Liverpool is notorious, apart from any other causes, is an efficient cause of excessive mortality from respiratory diseases. A marked diminution in the number of occupied cellar-dwellings has been effected in recent years, but even to-day the number is excessive. It is also obvious that healthy, well-nourished children are less liable to respiratory disease than children debilitated by bad feeding and neglect, and so excessive infant mortality from lung disease is closely associated with excessive infant mortality from diarrhœa and debility.

It has been estimated that one-half of all the deaths of infants is due to errors in feeding, although this large proportion is not obvious in the mortality returns. The convulsions from which so many children die (it is seen that deaths from nervous disease are excessive in Liverpool) are due in the great majority of cases to gastric irritation from improper food. In Liverpool,

whatever may be the cause, deaths from diarrhœa and atrophy are very excessive, being 14 per 1000 births more than the average for all England. It is now generally recognised that infantile diarrhœa is a disorder induced by improper food. Dr Hope has shown that out of 1000 fatal cases of diarrhœa in Liverpool the deaths of infants fed artificially are out of all proportion more numerous than the deaths of infants brought up on the breast. There is a growing tendency to rear children artificially, but it is certain that the children suffer in consequence. Dr Routh long ago pointed out the difference of development in the two cases. In spite of the large number of artificial foods which are so widely advertised, the ideal food has not yet been discovered. Indirectly the debility caused by improper feeding tends to cause a fatal issue to any acute illness which may attack the child. Not only is such an illness more likely to occur: its peril is also greater. Not infrequently an illness beginning with diarrhœa results in prolonged and fatal debility. The child dies from exhaustion—in reality it is starved to death. Ignorance is the chief cause of improper feeding, but ignorance becomes reprehensible, if not actually criminal, when, as is so often the case, a child under the age of 12 months is just fed " on anything that is going." It is hard to prove actual criminality. The doctor is called in, in many cases, only when the child is *in extremis*, and then really only to sign the death-certificate. He has no evidence of criminal neglect, and even if he refuses a certificate, the difficulty of proving that after all the death was not due to natural causes is almost insurmountable. There are no characteristic features of slow starvation. Similar appearances are produced by natural causes in the wasting of disease. Advantage is taken of this difficulty, and we believe that fatal debility is in a large number of cases due to deliberate neglect. It is well known that frequently children in the last stage of emaciation, carefully tended and nursed as in-patients of a hospital, speedily recover, only to relapse and to die when restored to their careless and pitiless mothers.

Passing now to the consideration of deaths by violence.[1]

[1] Data for England are published in detail, *Royal Statistical Society's Journal.*
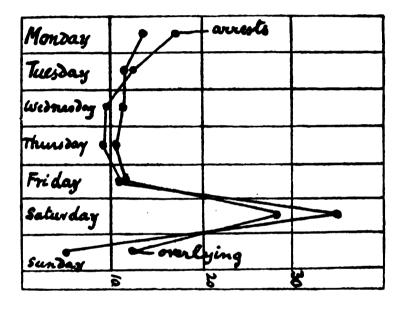
It is a startling fact that during the 25 years 1863–1887, of all
the deaths ascribed to murder, 61 per cent. were those of children
under 1 year of age.   It is also a matter of grave importance that
the infant death-rate from violence rose steadily from 1885 to
1890, when it reached a figure in excess of any ever previously
recorded; and it was almost as high in 1891.   This is true not
only for Liverpool but for the whole of England, showing that it
is due to widespread and not to purely local causes.   But there
is a peculiar local interest in this subject: as in many other
matters which are of evil reputation, Liverpool heads the list.   Of
every 1000 children born in Liverpool, 9 died during infancy by
violent means, whereas the rate for all England is only 3.   When we
came to investigate the causes of this deplorable state of things,
we were led irresistibly to one conclusion.   The great source of
this violence, this criminal violence, is drink.   We are not preju-
diced: we are not fanatics on this question.   But we cannot
avoid the conclusion that Liverpool is the city where children
are treated with more fatal and criminal violence than elsewhere,
because Liverpool is, or has been recently, the most drunken city
in England.   We investigated the rate of infant mortality in 58
towns having a population of over 10,000.   We found that the
rate of infant mortality varied with the rate of drunkenness, as
measured by the apprehensions for drunkenness per 1000 inhabi-
tants.   We further found that the death-rate of infants from
violence varied also with the rate of intemperance.   Again, a large
proportion of the infants who die violent deaths are suffocated by
their parents in bed.   We may add that this number is steadily
increasing.   The local Society for the Prevention of Cruelty to
Children prepared a map of Liverpool showing the districts in
which certain forms of crime are most prevalent, and it shows
that a large proportion of deaths from suffocation occur in
localities where drunkenness, immorality, and overcrowding
are prevalent.   This association of violence and drunkenness is
still more strikingly shown in other ways.   The Registrar-
General published a report on infant suffocation in bed.   His
tables show that considerably more than twice as many deaths
occur on Saturday night as on any other day in the week, and,

as might be expected, rather more deaths occur in winter than
in summer.   He suggested that the reason of the greater
mortality on Saturday nights was due to drink.   Among the
wage-earning classes, wages are generally paid on Saturdays,
and the first use made of them is, in many cases, to get
thoroughly drunk.   The infant is in the same bed with the
drunken mother, and is suffocated.   When accused of the crime,
the defence is always the same, and there is too much tendency
to regard the fact of the parent being drunk as in some measure
a palliation of the offence.   It really aggravates it, and the time
has come when the suffocation of an infant in bed should be
made a penal offence, whatever may be the condition of the
parent.   It is perhaps too much to ask that it should be an
offence, for an infant to be in the same bed with an adult.
There is no means of securing evidence to enforce such a law.
It is true that under a former penal code in Prussia it was an
offence, but this has not been retained in the revised code.
But it is possible to punish the parent for the death of the child,
and this ought to be done.   The connection between suffocation
and drunkenness is not merely a matter of inference, as implied
above.

				Suffocation.	Drunkenness.
Sunday, .	.	.	.	124	50
Monday,	.	.	.	137	171
Tuesday,	.	.	.	116	124
Wednesday,	.	.	.	115	97
Thursday,	.	.	.	107	91
Friday, .	.	.	.	118	112
Saturday,	.	.	.	283	352

If the deaths (all England) from suffocation be classified
according to the day of the week upon which they occur, it is
seen that more than twice as many are referable to Saturday
night than to any other day of the week.   If we examine the
apprehensions for drunkenness in Liverpool in a similar manner,
a parallel series of figures is obtained, and if the two series be
plotted as curves the identical form of the two curves is very
apparent.   Although deaths from suffocation for all England,

and drunkenness in Liverpool, are being investigated, there is no reason to doubt but that arrests for drunkenness for all England would have a similar daily distribution as in Liverpool. The close interdependence of suffocation and drunkenness is thus shown. Into the causes of drunkenness we do not enter, but we must mention, with special reference to the remedies for excessive infant mortality, that drunkards and criminals are notoriously ill-educated.

We next consider child insurance. The opinion that child insurance is directly responsible for much of the waste of child-life is very prevalent. Impassioned orators are eloquent and definite on this point, but when appealed to for precise information, generally fall back on the Reverend Benjamin Waugh, who in his turn is discreetly vague and unsatisfactory. We have found it necessary, in consequence of this unwillingness to give precise evidence on the part of those who are supposed to be authorities, to investigate the evidence which is in existence ; and this seems hardly sufficient to substantiate the general condemnation which is pronounced against child insurance.

For the last half-century child insurance, either in the form of burial insurance or life insurance, has been in existence, originating in Liverpool and other towns where high infant mortality prevailed. For the last 20 years it has been alleged that this insurance tends to high infant mortality, for in 1871, Mr Curgenven, giving evidence before the Select Committee on the Protection of Iufant Life, stated his belief that " children insured in burial clubs die in a much larger proportion than children not so insured," and other witnesses were of a like opinion ; but the Committee merely stated in its report that it had been suggested to them that " no infant or very young person should be entered in a burial club, or become the subject of life insurance." By the Friendly Societies Act of 1875, the statute of George III. which prohibited the insurance of the life of another in which there was no insurable interest, was repealed so far as children under 10 years of age are concerned, but the amount was limited to £6 under the age of five years. Burial insurance thus became life insurance. The 1889 Committee on Friendly Societies in their report state that evidence was given tending to show that not only is infant insurance an incentive to crime, but that a widespread system exists under which much neglect, cruelty, and crime takes place with impunity. They reject the statistical evidence, owing to the difficulty of drawing therefrom a safe conclusion. They admit that insurance for burial expenses is highly valued by the working-classes for perfectly legitimate reasons, and that an unnecessary hardship would be inflicted upon them if it were prohibited. The question is, whether the defenceless state of the children of the poorer classes is such as to make it imperative that this system of insurance should be prohibited, or more stringently guarded. Although numerous suggestions for the amendment of the existing law were offered, the Committee contented itself with recommending that the age for juvenile insurance be raised to 16 years, and that the total sum insured for on death under the age of 5 years should be diminished to £4. They also urged the addition to the certificate of death of a column for particulars of insurance. The Reverend Benjamin Waugh, Director of the National Society for

the Prevention of Cruelty to Children, has estimated that over 1000 children die annually, or are made to die, for the sake of the insurance money. He estimates that about 33 per cent. of the children of the industrial classes are insured. From statistics supplied by the Manager of the Prudential Insurance Company, and used by Captain Marshall (*Fortnightly Review*, December 1890), it appears that 80 per cent. of such children are insured. Probably the truth lies between these two estimates. Inquest statistics show that about 50 per cent. of children are insured. Dr Hope, in the investigation of 1000 fatal cases of diarrhœa in Liverpool previously referred to, found that nearly 64 per cent. were insured. It is probable that Mr Waugh underestimates the frequency of insurance as much as Captain Marshall overesti- mates it, *but it is at least obvious that child insurance is very general.* It is consequently certain that the influence of a small number of deaths directly caused for the sake of the insurance money affects general mortality statistics to an inappreciable extent. It is therefore impossible to estimate the influence for good or for evil of child insurance, by the simple study of mortality statistics. The only available means of estimating the influence of insurance is by the number of cases of proved infanticide for the sake of insurance money. Such instances of people permitted by the Act to insure are comparatively few in number, the report of the Committee merely stating that the allegations of culpable and even wilful neglect and violence have been in some cases well founded, and that the object of such neglect and violence has not been disconnected with the sums payable on the death of the children. This, it will be noticed, is an exceedingly cautious statement. Under the Friendly Societies Act, 1875, no insurance money may be paid on a child's death, except to the parent, or personal representative of such parent. The majority of the flagrant cases have occurred owing to the loose interpretation placed upon the words " personal representatives " by many of those who are called upon to comply with the Act.

Our conclusion is that child insurance is accorded an import- ance far beyond its merits. The same amount of energy directed to the suppression of a perfectly obvious preventable form of

death, namely, suffocation in bed, or to the amendment of the law as to the sale of opiates, might result in a greater saving of child life than would result from the total suppression of insurance.   It would be as rational to interdict fire insurance because of the recent epidemic of cotton fires in Liverpool, as to prohibit child insurance because of a few proved cases of infanticide.

If the inducement offered by a small sum received from insurance on the death of a child is sufficient to determine infanticide, it is overwhelming evidence of the light estimation in which child life is held.   The proper remedy therefore is not the suppression of insurance, but the raising of the estimate in which child life is held.   We suggest, however, that the lower scale of payments adopted by the Committee ought to be accepted, and the adoption of a system of child insurance registration by the municipality as a temporary and tentative measure.   By such a register accurate information as to the influence of insurance would be obtained and its future determined.   Medical supervision is impracticable.   It would be impossible to replace the present collecting societies by any system of state insurance without collectors.   An attempt by Mr Robertson Gladstone to found a non-collecting society in Liverpool has only met with a partial measure of success.   The ideal insurance system would be endowment insurance, by which the life of the infant, and not its death, is a source of profit.

We have now to consider how this excessive infant mortality is to be prevented.   The remedy is threefold.

(1.) The sense of parental responsibility must be developed.

We have already noted the comparative safety with which children may be ill-treated, or even done to death, in the privacy of home.   It was estimated that in Preston during one year the mortality among the children of the upper classes was between 150 and 160, of the middle classes 320, and of the insuring classes, or industrial classes, 600 to 640.   Obviously these differences depend upon the greater care and attention which the well-to-do children receive, and these in turn depend upon a greater sense of parental responsibility.   Until the value of child life is more fully recognised and more generally realised, all effort to diminish

infant mortality to any appreciable extent must be futile. The education of the public conscience on this point is a duty which all ministers of religion owe to the community, and ought to be made a special care by them. Hitherto the relation between them and their people has been too much restricted to matters of faith and religion. This is, after all, only a part of their duty as moral teachers. It is of interest to state that whenever we have mentioned the terrible sacrifice of child life which prevails to our friends and acquaintances, especially women, to whom we now offer thanks for their unconscious help, the invariable remark has been to this effect, " Poor things, they are happier dead." If educated people regard the massacre of the innocents as an un-mixed blessing, it is vain to expect less educated people to regard child life as sacred, although their standpoints are so different. We have also pointed out that half the deaths of infants are due to bad feeding, in other words, to starvation, and that this depends upon ignorance. In our national system of education, some prominent place ought to be given to domestic training. In rural districts infant mortality is low. This fact cannot be explained by the abundance of fresh air, or by a high standard of general education which obtains there. It can only depend upon the better training of the young girls, who are familiarised from their earliest youth with the care and management of children. The highest standards in the Board schools might well include sound elementary instruction on this subject: not theoretical instruction as to the percentage of proteids in milk, and such like, but practical rules for the feeding and care of infants.

(2.) The development of technical instruction by local authorities affords another opportunity of imparting this know-ledge. The adoption of domestic training as a subject of technical instruction, and the appointment of well-qualified lady teachers to instruct the industrial classes through the medium of mothers' meetings, and of other religious and social assemblies, as well as by well organised special classes, would be a step in the right direction. House-to-house visitation would be best of all. But this would of necessity be optional, and

depend entirely for its success upon the tact of the lady teachers. A mission field exists, neglected and uncultivated, as wide and as important as that of India or of China—with only one disadvantage, that it is too near home. The Buckinghamshire County Council has set an example in this direction. Through the energy and initiation of Dr De'Ath, the County Medical Officer of Health, ladies are being trained as rural health missioners. Their duties are to lecture in a popular and homely way on the management of personal health, and on the management and care and feeding of infants. Special stress is laid on house-to-house visitation and individual teaching. Much tact is required to avoid giving offence—a point humorously and yet pitifully illustrated in a recent copy of *Punch,* where an irate mother resents the teaching of the new young doctor as to the management of her children, on the ground that she ought to know all about it, having buried fourteen of her own. We commend the Report of the North Buckinghamshire Technical Instruction Committee on Health at Home to the notice of all who are interested in this subject.[1]

Another duty seems likely also to fall upon the local authorities—the provision of day nurseries. Even in Liverpool many mothers are obliged to work and leave their babies at home under the care of older children scarcely bigger than their charge, or are obliged to entrust them to the tender mercies of a complaisant neighbour more ignorant of babies than the mother herself. Some trust to opiates. The extent of this is best judged by an inquiry which one of us personally made last week in a small colliery village in North Wales. Three quarts of laudanum are sold at one shop every week. The colliers and their wives, more especially the wives, take laudanum habitually, and it appears that it is a frequent practice for a mother, before going to work in the morning, to brew a "punch," as they call it, for her infant. Placing a lump of sugar in a small tea-cup, 1, 2, 3, 4, or 5 drops of laudanum are poured on it, according to the age and previous habits of the child, for

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[1] Work in this direction is being done by the Liverpool Ladies' Sanitary Association.

they regulate the dose to a nicety, and no accidents ever occur. A tea-spoonful of hot water is added, and the dose administered to the child, who sleeps until the mother returns. In Liverpool soothing syrups are extensively used for the same purpose, and from time to time a fatal result is reported. This state of things cannot be tolerated. The law must be made more stringent, and must be enforced. At the same time the care of the child must be undertaken, and it seems to us the only practicable method of doing this is by means of day nurseries. The two day nurseries belonging to the Liverpool Children's Aid Society in Stafford and Juvenal Streets, had during 1891 an annual attendance of nearly 14,000 children—an average of 44 per day. It appears that the cost of a day nursery is nearly 6d. per child per day, or about 3s. 6d. a week. The utmost charge that can be made is 1s. a week, so that 2s. 6d. a week per child must be met by donations or subscriptions. It is hardly fair to expect this deficiency to be defrayed in this way; and in view of the evidence offered before the Committee on the Infant Life Protection Bill of 1890, by which it was urged that no child ought to be allowed to be received from the custody of its parents for hire unless by a registered person, the establishment by County Councils of a widespread system of day nurseries seems desirable. This plan is also strongly advocated by the Medical Officer of the Lancashire County Council.

The provision of healthy dwellings is already imposed by law or municipal authorities, and efficient powers for sanitary control already exist.

(3.) Lastly, the Imperial Parliament has provided in the Prevention of Cruelty to Children Act some means of repression. These means require to be extended by provision for the punishment of overlying; the sale of opiates and their administration to children require to be more stringently guarded; but we cannot now consider other imperial legislation.

We have brought forward the subject of infant mortality in Liverpool because we think that it is a matter demanding more attention than has hitherto been paid to it, and that many people have been unaware of the magnitude of the evil. It has

more than a local interest: what we see in Liverpool is only an exaggerated form of what is occurring all over England, and must tend to breed a brutal indifference to helpless suffering which cannot fail to leave its mark on the national character. Ignorance is largely at the root of the matter. "My people are destroyed for lack of knowledge." "Knowledge is power, and power implies trust. We who enjoy knowledge are the trustees of power. People are ignorant because they are ignorant; they do not desire knowledge, because they have not even the knowledge to know that knowledge is desirable. They are to be pitied and to be helped. By whom are they to be pitied, and by whom are they to be helped, but by those to whom the highest privileges of knowledge are entrusted?"

CASE OF THROMBOSIS OF THE LEFT INFERIOR CEREBELLAR ARTERY, WITH CORD LESION. By ALFRED W. CAMPBELL, M.D., *Pathologist, Rainhill Asylum.*[1]

THE case, the account of which I propose reading to you to-night, is of supreme interest to the neuro-pathologist, and at the same time cannot fail to excite the attention of the anatomist, the physiologist, and the clinician. For, firstly, it provides us with an example of an uncommon gross lesion, viz., a softening of the cerebellum; secondly, a microscopical investigation reveals the extraordinary fact that certain tracts in the spinal cord, which are continuous with the cerebellum, which experimental pathologists and others have taught us to believe are centripetal tracts, are in this instance diseased, and from apparently no other cause than this cerebellar lesion; thirdly, through the medium of this case I have been enabled to confirm some previous observations on the anatomical distribution of these tracts; and lastly, it may serve to throw some light upon the functions and anatomy of an organ which, in spite of the fact that it has attracted the attention of writers whose number is legion, and many of them recent ones, is yet more or less wrapt in obscurity. Before proceeding any further, I will read you an abstract of the clinical and post-mortem notes of the case, and the result of the microscopical examination of various parts of the nervous system, mentioning in detail all points of importance.

The patient was a female, aged 62, and was admitted to Rainhill Asylum on August 3, 1892, suffering from acute melancholia. The history of the case was related by her

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[1] Read at a Meeting of the Pathological Section of the Liverpool Medical Institution, December 14 1893.

daughter as follows: " On the evening of the 18th of December 1891, she was seated by the fire knitting when she became suddenly giddy and fell off her chair; on attempting to rise she found that all her extremities were weakened; this weakness, however, was undoubtedly more pronounced on the left side than on the right, and was not so severe as to prevent her from crawling to her bed. Thereupon an attack of vomiting accompanied by a severe headache ensued, which she attributed to a " bilious attack." She never lost consciousness. Three days later the left side was entirely paralysed, and she was talking foolishly and rambling. The day before Christmas she was maniacal, but the mental symptoms disappeared in three days; she remained in bed for a fortnight, gradually recovering power all along; in three weeks' time she could again knit, and two months later could take a five-mile walk. With the exception of the headache she never experienced any pain, and never complained of any false sensations such as formication, heat, or cold. She could judge distances, never spilt liquids when carrying them, could wash and do up laundry, and in fact seemed not to have lost muscular sense. In May 1892, she became depressed, and mentally grew progressively worse up to the date of her removal to the Asylum."

On admission her expression was melancholic, and she appeared prematurely aged. The malar capillaries were dilated, the forehead furrowed, and the skin of the face velvety and brown; the pupils were normal. There were no indications of sensory anomalies. She was not ataxic, and could knit, sew, and dress herself; her gait was a shuffling one, and she was distinctly weak in the left leg; her muscles were feeble and atonic, but there was no localised wasting. There were marked lingual tremors. By March the paresis of the left leg was more marked, and there was some drooping of the left shoulder; her melancholia was still of an acute agitated nature. She had grown much thinner and had lost all memory for recent events. On May 18, she accidentally sustained an intracapsular fracture of the neck of the left femur, but in three months' time was so far recovered as to be able to walk; she was, however, extremely

enfeebled, and gradually declining, died on the 22nd of September.[1]

Note.—There is no doubt that the seizure alluded to played an important rôle in the causation of her insanity, but it must also be mentioned that she was also predisposed to mental disease by heredity.

The encephalon weighed 1345 grammes, the larger cerebral vessels were somewhat atheromatous, the cerebral hemisphere presented the signs of general senile atrophy; but there was absolutely no gross lesion detected in any part of them. The cerebellum weighed 113 grammes; it was of soft consistence universally, and the cortex was shallow. On the inferior aspect of the left hemisphere was an old sclerosed area where the substance of the organ was destroyed to the depth of a quarter of an inch; it was covered by the thickened pia-arachnoid membrane, and it was obvious that a blocking of the left inferior cerebellar artery had occurred, and that this patch represented the remnants of the softened parts resulting from thrombosis of that vessel. As seen in the accompanying drawing, the destroyed area comprised parts of the following cerebellar subdivisions: the uvula and pyramid of the inferior vermis, the tonsil, the velum medullare posterius and the inferior anterior, middle, and posterior lobes. The right hemisphere was normal, and the pons varolii and medulla oblongata also presented no macroscopic alteration.

The spinal cord was of healthy size, the vertebræ normal, and no signs of tumour, of caries, or of any morbid growth which might cause compression-myelitis were discoverable. The cord was not cut in the fresh state; but on section, after partial hardening, a white circumscribed area could be easily recognised with the naked eye in the dorsal segment of the lateral columns, and this could be traced continuously from the highest cervical to the lowest sacral segments.

With regard to the remainder of the autopsy, the following

points are the only ones worth notice. Granular contracted kidneys were found; the heart-muscle of both ventricles was tough and hypertrophied, and all the cavities were dilated; there was some thickening and atheroma of the cusps of the aortic and mitral valves, suggestive of a previous endocarditis.

Microscopical Examination.—The following parts were all hardened in Müller's fluid: the cerebellum and its peduncles, the pons varolii and medulla oblongata, the spinal cord and some peripheral nerves. The spinal cord and peripheral nerves were examined after preparation by the osmium-bichromate method of Marchi, while the serial sections, from the pons, medulla oblongata, and cerebellum, were stained by Schäfer's modification of the method of Pal. Since this method is not perhaps familiar to us all, and as in Schäfer's hands it has given very even and excellent results, and my experience with the method has also been a happy one, I may be allowed to briefly run over the steps in the process. Portions of nerve-tissue are hardened as usual in Müller's fluid, and then in alcohol. Sections are cut; these are placed for twenty-four hours in a capsule containing Marchi's fluid; from this they are transferred for some hours (leave over night) into a solution, the constituents of which are as follows:—

Hæmatoxylin (cryst.), 1 grain, dissolved in a little abs. alc.
Acetic acid, . 2 c.c.
Aq. Dist., . 100 c.c,

They are next washed and bleached as in the final steps of Pal's process,

For convenience in description I will commence with the spinal cord and follow the degeneration upwards. At the level of origin of the second sacral pair of nerves, a small degenerated patch is seen at the periphery of the dorsal part of the left dorsal segment, occupying the position of the crossed pyramidal tract, or direct cerebellar tract. It seems to be composed entirely of fibro-cellular tissue, and in it there are no fibres undergoing acute parenchymatous degeneration. Some diseased fibres in the posterior root zone of both sides are noticed, and the number of

healthy cells in the left anterior cornu is considerably less than in the right.

At the level of origin of the fifth lumbar pair of nerves the patch of degeneration is seen in the same position, but it is considerably increased in dimensions. Diseased fibres are again seen in the posterior root zones.

At the level of origin of the ninth dorsal pair of nerves the patch is noticed to have further increased in size, and is assuming a wedge shape. Degeneration of the direct cerebellar appears to be almost complete, and few acutely degenerating fibres are seen in it. There are scattered diseased fibres in the adjoining crossed pyramidal tract. The number of nerve-cells in the left vesicular column is obviously below normal.

At the level of origin of the third dorsal pair of nerves the diseased patch is still more extensive, and it is somewhat further removed from the dorsal horn than in the last section. Degeneration of the direct cerebellar tract is again almost complete, and diseased fibres are disseminated throughout the external part of the crossed pyramidal tract. A small collection of diseased fibres is observed in the right ascending antero-lateral tract. The number of nerve-cells in the vesicular column of Clarke is on both sides diminished, and the columns are small.

At the level of origin of the sixth cervical pair of nerves the degeneration is more diffuse; this is especially the case in the crossed pyramidal tract. The direct cerebellar tract is still the one which is most affected. A fringe of degenerated fibres is seen to run forwards at the periphery of the left segment immediately in front of the direct cerebellar tract. This marks the position of a portion of the ascending antero-lateral tract. A trace of degeneration is again seen in the opposite (right) antero-lateral tract. A small collection of diseased fibres is observed, adjoining the left dorsal root at the periphery of the column of Burdach. The external process of the left ventral cornu seems to be atrophied, and there appears to be some degeneration of the corresponding cell group. At the level of origin of the fourth pair of cervical nerves one notices similar

appearances to those described in the last section, with the exception that the degeneration is a trifle more diffuse, and that the crescent of degenerated direct cerebellar fibres now reaches the dorsal cornu.   The degeneration in the column of Burdach now shows itself towards the inner third of the column.   The condition of the left ventral cornu remains similar to that described in the last section.

Before leaving the cord I will draw attention to the presence throughout the white matter of isolated, disseminated, degenerated nerve-fibres, and also to the excess of pigment in the cornual ganglion cells, and mention that I believe them to be nothing but senile changes, bearing no connection with the lesion under consideration.   I would further state that degenerated fibres can be found in both the ventral and dorsal nerve-roots all along the cord; they are most numerous in the dorsal roots of the lower segments, but in no position is their number striking.

With regard to the peripheral mixed spinal nerves, those of the left lower and upper extremities unquestionably contain more degenerated fibres than one can account for by a senile change.

Turning now to the serial sections of the pons varolii and medulla oblongata, those from the lower end of the medulla show clearly a well-defined patch of degeneration at the lateral border immediately ventral to the substantia gelatinosa Rolandi of the left side; this is undoubtedly the direct cerebellar tract. In the left funiculus cuneatus a strip of degenerated fibre is also seen, which represents the continuation upwards of the disease in the column of Burdach.   The degenerated fibres cannot be traced so readily in these sections as in those prepared by the method of Marchi, and, accordingly, the degeneration in the lateral pyramidal and antero-lateral tracts is lost sight of.   As the pyramids commence to cross, the two above-mentioned patches of degeneration become more widely separated, and the cuneate patch is pushed more towards the periphery.   At the level of the ascending root of the glosso-pharyngeal nerve the degenerated cuneate fibres are seen lying in the centre of the nucleus of that name, while

the degenerated cerebellar tract maintains its relation to the substantia gelatinosa. As the floor of the fourth ventricle opens out, and the ascending trigeminal root increases in size, the latter insinuates itself between the substantia gelatinosa and the direct cerebellar tract. The degenerated cuneate fibres can still be seen lying just outside the ascending auditory root. As we approach the cerebellum the two degenerated patches become merged in the restiform body, the direct cerebellar tract occupying the lower segment, the cuneate fibres the upper; thence they can be traced to the cerebellum. In addition to these degenerated bundles there is obvious degeneration at the level of the sixth, seventh, and eighth cranial nerve nuclei in the external and internal arciform fibres, particularly of the left side, and there seems also to be some ascending degeneration in the left fillet. The brachia conjunctiva and the posterior longitudinal bundles seem healthy. In the cerebellum the grey matter down to the horizontal ramus in the site of the above-mentioned destroyed patch was almost completely obliterated, only being represented by fibrous tissue and debris; the lower part of the horizontal ramus was also degenerated, and the corpus dentatum slightly involved in its lower part.

The lessons to be learnt from this case are so numerous and varied that one is almost at a loss to know which point to discuss first; however, for the sake of convenience, I will commence with some remarks on the cord degeneration. Now, firstly, with regard to the disease of the direct cerebellar tract, I have pointed out that this tract throughout the whole of its course has been entirely destroyed, and from an anatomical standpoint I would ask you to note that I have been able to confirm the observation of Mott (1) and others, and demonstrate its course in the medulla oblongata along the restiform body and through the inferior peduncle to the cerebellum on the same side; again, the connection of the tract with the vesicular column of Clarke is also indicated by the presence of degeneration in the nerve-cells of that column on the same side as the

lesion (as you know, the majority of fibres in the direct cerebellar tract have been proved to come from the cells in that column, and therefore it is that the tract is larger and better developed in the dorsal region, that is to say, in the region where the column of Clarke is situated, than it is in the other spinal segments). Further, the case also proves that the fibres of the direct cerebellar tract must be connected with some or all of the parts of the cerebellum which have been destroyed, else they would not have degenerated in the way that they did. This agrees to a certain extent with Auerbach's (2) view that the direct cerebellar tract terminates in the vermis, for that structure was in this case partially destroyed. So much for the anatomical distribution of the tract. When we come to consider the degeneration from a physiological standpoint, we are at once confronted with a most serious difficulty, for the direct cerebellar tract is one, as you are aware, which we have always been taught to regard as a centripetal tract, and on perfectly sound grounds, since there is abundant evidence showing that compression lesions such as caries, tumours, injuries, &c., affecting the cord above the level of the junction of the dorsal and lumbar regions, where the tract is supposed to commence, or an experimental hemisection of the cord in the same part, causes upward degeneration, and since the tract degenerates in an ascending direction, our previous experience of other degenerations warrants the assumption that the direction of the conduction of impulses in that tract is also an upward one; and lastly, we have a decisive statement from Gowers (3) to the effect that we do not know of a single fibre descending from the cerebellum to the spinal cord, which should further clinch this assumption; and yet in this case, in which there is no evidence whatever of a cord lesion in the supposed site of origin of the tract, but in which there is a distinct gross cerebellar lesion, we have the tract diseased throughout its whole extent; and this brings us face to face with our obstacle. So far as I have gone in my perusal of the literature on cerebellar affections with associated cord lesions, I have not been able to unearth a record of another anomalous case such

as this, but, unfortunately, the time at my disposal has not permitted of my examining all the continental work on the cerebellum; still it is unlikely that such cases have been reported by foreign writers, for were that the case they would have been undoubtedly quoted or referred to by English writers on diseases of the cerebellum or on degeneration of this tract. Since this, then, is the only clear case which I can command in which degeneration of the tract in question has occurred, apparently secondary to a primary cerebellar lesion, and as there is such an overwhelming array of positive evidence in favour of the centripetal course of the fibres, it would be inopportune for me to decisively reverse the order of things by stating that the tract is really a centrifugal and not a centripetal one, and yet the presumptive evidence yielded by the case is strongly in favour of such a hypothesis; and further, there are certain experimental and other observations which I might here mention that lend support to this view, and certainly serve to refute Gower's previously cited dictum that we do not know of a single fibre passing downwards to the spinal cord, a statement which has been so strenuously opposed by Bechterew (4). (Bechterew's original paper is unfortunately one of those which I have not yet been able to procure.) In the first place the experimental studies of Marchi (5) and Luciani (6) on the functions and structure of the cerebellum prove that fibres from the middle peduncle of the cerebellum enter the pyramidal tracts and descend in the cord on the same side. Again, Menzel (7) observed in a case of developmental atrophy of the cerebellum that the posterior column and lateral cerebellar tracts were ill represented in the cord, and it was mainly the cord change presented by this case that led Senator (8) to formulate the latest theory concerning Friedreich's disease, viz., that in that condition the primary change is in the cerebellum, possibly an atrophic process, while the degeneration in the posterior columns and lateral cerebellar tracts is quite of a secondary nature.

Though I venture to state that, had such cases as this which I am reading to you been reported before all the valuable

experimental work on the tract had been undertaken, neurologists would be divided in their opinions as to the physiological nature of the tract, still, as the evidence which I have adduced to show that the tract is a centrifugally-conducting one is scanty and inconclusive, we will still assume that the tract is a centripetal one, and endeavour to account for degeneration of the tract on grounds which will meet this view; and naturally the most plausible theory that occurs to one is, that in consequence of the obliteration of the terminus to which the direct cerebellar fibres run, the tract being robbed of its function, so to speak, is thereby rendered prone to degenerative and inflammatory changes. This theory similarly assists us in explaining the concomitant atrophy of the nerve-cells in the vesicular column of Clarke. Another contention that might be urged is, that just as in the case of peripheral sensory nerves, and also in some motor nerves, as Darkschewitch (9) has shown, degeneration may occur along the nerve against the known course of conduction; so in this particular instance degeneration has ensued in a direction opposite to that in which the impulses travel. This contention, however, might, as you see, be taken *vice versa*. I have now, perhaps, sufficiently indicated that there are objections which prevent our adoption of the generally accepted doctrine, that the direction in which impulses travel in the direct cerebellar tracts is a centripetal one, and that the matter must therefore still remain *sub judice*.

With regard to another column of fibres which I have shown to be degenerated in this case, viz., the postero-external column, or column of Burdach, you have noticed that the degeneration has not been extensive. It is first observed at the level of origin of the sixth cervical pair of nerves, and is absent in the section made at a point opposite the origin of the third pair of dorsal nerves. It is only a partial degeneration, and first appears towards the peripheral end of the column. From the spinal cord it can be distinctly followed upwards into the cuneate nucleus in the medulla; but the degeneration does not cease in the cuneate nucleus, for it can be distinctly traced into the corpus restiforme, and thence into the cerebellum of

the same side; and thereby the anatomical observations of
Flechsig and Hosel (10) and Darkschewitch and Freud (11),
showing that this column is directly connected with the cere-
bellum, are confirmed. The volume of the degenerated patch
of fibres seems to increase as one ascends. It is interesting
to note that, at any rate, a portion of this column must also,
as in the case of the direct cerebellar tract, have a direct
connection with some part of the cerebellum which was
destroyed; possibly, if the area of destruction on the cerebel-
lum had been more extensive, we should have found more
degenerated fibres in the column and a lower distribution of
the degeneration. Another point of interest bears upon the
site of origin of the fibres of this column. Bechterew (12)
holds that the short segmental fibres of Burdach's column arise
exclusively in the vesicular column of Clarke, but in the region
in which this column is in this case degenerated, the column
of Clarke is remarkable for its absence. Finally, you will again
observe that a column which usually degenerates upwards is
in this case apparently degenerated downwards, in consequence
of the cerebellar lesion. Some remarks might here be intro-
duced on the pathology of ataxia, and the relation between
cerebellar disease and tabes dorsalis, but these must be put
aside and more relevant details discussed.

Let us consider next the degeneration in the antero-lateral
ascending tract. I have pointed out that in the lower dorsal
region some fibres in the ventral part of this tract are in a
condition of acute parenchymatous degeneration. Degenerated
fibres can also be traced in the cervical segments and upper
dorsal segments, but unfortunately I have not been able to
accurately follow the degeneration in the metencephalon, for
the simple reason that the number of degenerated fibres is
not great (by no means the whole tract being diseased), and
the method of Schäfer is not nearly so well adapted for the
demonstration of such a minute bundle of fibres as is the
highly selective method of Marchi. You will have noticed,
also, in the upper dorsal and cervical sections, degeneration of
a few fibres in this tract on the opposite site of the cord.

This is explained by the fact that the tract is a crossed one, and that fibres pass from one vesicular column of Clarke across the anterior commissure to the opposite ascending antero-lateral tract. This point has been proved not only by developmental studies, but also by Guarneri and Bignami's (13) case of old-standing amputation of the thigh, in which ascending degeneration in the antero-lateral tracts of both sides was discovered. Naturally, many of the remarks made concerning the direction of conduction of impulses in the direct cerebellar tract will apply equally well to this tract.

Discussing, in the next place, the condition of the crossed pyramidal tract in the cord on the side of the primary lesion, though the line of limitation between the direct cerebellar and crossed pyramidal tracts in the spinal cord is not a sharply defined one, and it is known that many fibres of the direct cerebellar tract on its inner border intermingle with the crossed pyramidal fibres, yet it will have occurred to you that in the sections which I have placed on the table for your inspection, there are so many degenerated fibres in the position of the pyramidal tract that it would be absurd to declare that they are all, so to speak, aberrant fibres of the direct cerebellar tract. We must, therefore, take it for granted that they are pyramidal fibres, and that the cerebellar lesion has also in this case induced secondary degeneration in the lateral pyramidal tract of the same side ; but here again another difficulty crops up, for although we do not know that there is not an anatomical connection between the pyramidal tract in question and the cerebellum, yet such a connection has never been demonstrated, and, so far as I am aware, such a degeneration as this has never been described in consequence of a cerebellar lesion. Unfortunately, as the total bulk of the diseased fibres in this case is small, I have again not been able to follow the degenerated fibres with any degree of certainty through the medulla oblongata. Still, I am inclined to think that, had they been traceable, a connection with the cerebellum on the same side would have been demonstrated, and, in hazarding this opinion, I am supported by the following data. It is a comparatively well-

established fact, that all the fibres of the so-called crossed pyramidal tract do not necessarily cross at the usual site on the ventral side of the medulla. Some are said to cross in the neighbourhood of the fillet, and in the case of the cat, at any rate, as Boyce (14) has demonstrated, certain motor fibres from the cerebral hemispheres do not cross at all, but pass down in the lateral tracts of the spinal medulla on the same side. But although we have no conclusive anatomical proof for this connection with the cerebellum, still, the results of some other experiments which I will briefly mention, and certain clinical signs presented by this and other similar cases, make it appear likely, either that this connection exists or that the cerebellum has some motor functions. Firstly, Risien Russell (15), by ablation of one lateral half of the cerebrum in the case of dogs and monkeys, induced impairment of movement in the same side of the body, due not only to inco-ordination and increased rigidity of the muscles, but also to distinct paresis. Excision of the posterior part of the vermis caused evident paresis in both posterior extremities. Secondly, Boyce (16), in his experiments on the seat of origin and paths of conduction in the fits in absinthe epilepsy, found that in cats absinthe excitation after removal of one lobe of the cerebrum produced one-sided weakness (this agrees with Risien Russell's observations in the case of the dog); that "fits" may occur in the absence of the cerebellum, but removal of it, coupled with that of the opposite cerebral hemisphere, tended to produce unilaterality; that with one cerebral hemisphere and an intact cerebellum, impulses were transmitted to both halves of the body, and he concluded that impulses might descend through other channels than the known pyramidal tracts; for after removal of one cerebral hemisphere, though the corresponding pyramid degenerates and atrophies, yet "fits" can be evoked on that side by absinthe, which are, however, immediately arrested by hemisection of the cord. Lastly, the clinical sign exhibited in my case, which supports my view and coincides with these experiments, was the existence of paresis in the muscles of the extremities on the same side of the lesion: similar paresis, I

may mention, was noted in a comparable case recorded by my colleague Dr Menzies (17), in the last number of *Brain*. It is most unfortunate that in that case a microscopical examination could not be effected.

Lastly, let us study the case from a clinical aspect, and determine whether any points of diagnostic value have been brought to light, which will enable the physician to diagnose and locate the lesion in future. I will not detain you by discussing lengthy and complex theorisms on the functions of the cerebellum, but will briefly enumerate certain signs which would appear to be common to all cases of thrombosis of the inferior cerebellar artery. In the first place, a " seizure," an attack of giddiness, and sudden loss of power occasioning a fall, but not ending in convulsions, occurs; this may be accompanied by temporary amaurosis, and eye movements must be looked for—oscillating towards the side of the lesion. The patient need not necessarily lose consciousness, but a stuporose condition ensues, and cephalalgia induces unrest. Recovering from the shock, the patient will probably find that the paresis is restricted to the side of the lesion. Inco-ordination may be observed; the tendon reflexes on the side of the lesion may be exaggerated; sensation remains unimpaired. Should the arterial clotting not spread to the vertebral main, gradual recovery may take place, but you may expect to find that the localised paresis will never clear up.

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EXPLANATION OF PLATE.

In the drawing of the cerebellum, the site and extent of the lesion is indicated by the dotted area.

MEDULLA OBLONGATA—

1. Transverse section below the decussation of the pyramids.
2.   ,,   at   ,,   ,,
3.   ,,   opposite the lower end of the hypoglossal nucleus.
4.   ,,   ,,   upper   ,,   ,,
5.   ,,   ,,   nucleus facialis.
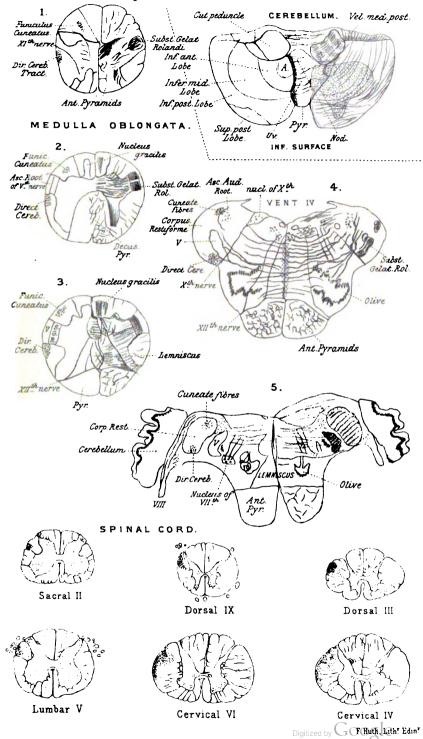
In all these drawings the degeneration in the left direct cerebellar tract and in the funiculus cuneatus of the same side is represented by black dots.

SPINAL CORD—

CERVICAL IV. Transverse section at level of origin of 4th cervical pair of nerves.

,,	VI.	,,	,,	,,	6th ,, ,,
DORSAL	III.	,,	,,	,,	3rd dorsal ,,
,,	IX.	,,	,,	,,	9th ,, ,,
LUMBAR	V.	,,	,,	,,	5th lumbar ,,
SACRAL	II.	,,	,,	,,	2nd sacral ,,

Situations where diseased nerve-fibres were found again indicated by black dots.

MITRAL STENOSIS.[1] By JAMES BARR, M.D., *Physician,*
Northern Hospital, Liverpool.

MITRAL STENOSIS has been an interesting study with many
workers in the medical field during the past thirty years, and
there is now a vast accumulation of literature on the subject,
so that anyone wishing to investigate the disease from a literary
rather than a clinical standpoint will find plenty of material
ready to hand.   For my own part, I think that much more in-
formation can be obtained from the careful study of individual
cases than from the perusal of much of the hackneyed writings
on the disease.   It is therefore the clinical picture of the disease
which I hope to present to you to-night ; and I shall studiously
avoid all polemics on questions of disagreement with other
writers, as the views which I am about to enunciate are the
result of personal observation, without any regard for the
opinions of others, except in so far as I have imbibed the
teaching of my friend and master, Professor Gairdner.
   The significance of the characteristic murmur of this lesion
was first clearly recognised by Fauvel, and by him designated
presystolic ; but it is to Dr Gairdner that the chief credit is due
for having firmly established the clinical signs of the disease
and their pathological importance, so that, when the murmur is
present, it has become one of the most easily diagnosed affec-
tions of the heart.   Professor Gairdner's contributions on the
subject were published in his *Clinical Medicine,* in 1862, and
since then there has been a slow but gradual evolution in our
knowledge of the subject ; but, compared with the great amount
of literature which has been devoted to its exposition, the real
additions to our knowledge are comparatively trivial, and the
value of some of those additions is an unknown quantity.   In
the present paper I have no intention of travelling over the
well-beaten track, but will chiefly confine my observations to

[1] Read at the Medical Institution, November 23, 1893.

some of the more obscure and unsettled points in the ætiology, diagnosis, and treatment.

Ætiology and Pathology.—Of all causes or exciting conditions of mitral stenosis, rheumatism holds the first place; but even when thus arising, I hold that there is a mechanical element in determining this particular lesion. The rheumatism lights up the endocarditis, and mechanical injury in the sequence of causation determines the sites of the chief mischief. The whole endocardium, and even the myocardium, may be more or less involved in the inflammatory process, but it is chiefly the vulnerable valves which have been brought into violent collision that are permanently injured. This mechanical view of causation has a most important bearing on treatment, as I shall afterwards show, as by relieving the laboured action of the heart in the early stages of endocarditis, the mischief can be mitigated, and its effects often removed.

In endocarditis associated with acute rheumatism there is frequently a beaded row of fine vegetations along the margins of both cusps of the mitral valve on its auricular surface, the parts of the valve which come into violent apposition during high intra-cardiac pressure. These vegetations are found to arise from proliferation of the cellular elements in the sub-endothelial layer of the endocardium. These groups of cells burst through the endothelium, and fibrin is deposited on the rough surface. When the rheumatic poison sets up endocarditis, the myocardium is, in the majority of instances, more or less involved. The contraction of the ventricle is slow and laboured, to overcome the relatively high intra-cardiac pressure which is set up by increased peripheral resistance. Compared with the temperature, the pulse in these cases is not very frequent, and may not exceed 90, even with a temperature of 103°. The pulse is slow, full, moderately strong, and the blood-pressure is well sustained. Among the earliest signs of endocarditis is a dull first sound, and a delayed radial pulse, so that the former can be heard an appreciable interval before the latter is felt. By careful attention to these signs, endocarditis can usually be diagnosed some days before

any murmur is heard. In fact, in some cases, by early recognition of the endocarditis, I have been able to avert any crippling affection of the valve. Recently Dr Oldmeadow drew my attention to a high-pitched mitral systolic murmur in a case of acute rheumatism. This murmur was only heard during expiration, and succeeded a dull first sound. The pulse was infrequent, slow, dwelt under the finger, and of moderate tension, and in the radial artery was felt immediately before the second sound was heard at the heart. I pointed out to Dr Oldmeadow that this was an early sign of endocarditis, and as it was due to high intra-cardiac pressure, with want of proper coaptation of the mitral cusps, it would be removed by a few doses of sulphate of soda, but probably would be replaced later on by a soft, blowing, systolic murmur. These events occurred as foretold, and now, under the influence of rest in bed, with ammonia and potash salts internally, the latter murmur is gradually disappearing, and the heart is assuming a normal condition. When the valve has been once damaged there is a marked tendency to maintain and develop the mischief, even under the ordinary action of the heart, but this is especially aggravated by violent collision of the cusps during palpitation, or from high intra-cardiac pressure from any cause. When free regurgitation through the mitral orifice takes place, the blood-pressure falls and the pulse increases in frequency.

As I have before stated, rheumatism is the chief agent which leads to the establishment of mitral stenosis, and in many cases the endocarditis may be the only gross expression of the rheumatic affection. This is especially apt to happen in children, who often suffer from rheumatism in such a mild form that it is spoken of as growing pains. In them rheumatism is very liable to affect the endocardium, and mitral stenosis is not an infrequent sequence. Hence, many writers have asserted that mitral stenosis is essentially a disease of early life, and many believe the disease to be frequently congenital. While not denying the occasional congenital origin of the lesion, I think it must be extremely rare, as the affection is very rarely detected under five years of age. Although it is very common

in youth and early manhood or womanhood, like its progenitor, rheumatism, it may occur at any age.

In a well-marked case of mitral stenosis in a middle-aged female at present under the care of my colleague Dr Dickinson, in the Northern Hospital, she denies ever having had rheumatism or gout, but her finger-joints are stiff and thickened, and her nails are reedy.

When directly associated with acute rheumatism, the edges of the valve are principally affected, and the edges of the cusps become gradually united, so that the funnel form of the lesion is eventually established. Frequently these cases begin with incompetence, pure and simple, but from fibrous contraction of the auriculo-ventricular orifice, and agglutination of the edges of the valve segments, they eventually end in stenosis, either with or without regurgitation. Some ten years ago I had a child under my care with acute rheumatism and well-marked mitral regurgitation. Under treatment the mitral murmur gradually disappeared, and she has been free from it for at least eight years. During the last two years she has suffered several times from intractable anæmia, amenorrhœa, high blood-pressure, occasional palpitation, and a certain amount of optic atrophy. Now, I am afraid, there is a slowly developing mitral stenosis.

Mitral stenosis is not uncommon, either in association with, or as a sequence to chorea, a disease closely allied to rheumatism, and here again we have the mechanical conditions in strong force. Syphilis has also been accredited with its origin, but this must be a very rare cause. Dr Byrom Bramwell thinks that in some cases large calcareous nodules in the walls of the ventricle—causing obstruction—are syphilitic gummata which have become calcified. It is not uncommon in chronic Bright's disease; and in these cases mechanical strain on the valve plays a very important factor in its causation. In such cases, in my experience, the orifice is not usually much contracted, but the whole segments of the valve are much thickened, and may be atheromatous or contain calcareous nodules consisting of lime salts or urate of soda. The musculi papillares are much hypertrophied, and the chordæ tendineæ thickened. In one of

the hearts which I showed to-night, the orifice was very much contracted, and there was slight granular condition of the kidneys, but then the latter affection was evidently secondary to the chronic congestion resulting from the heart mischief.

In a certain number of cases it is found without any rheumatic or other history which would readily account for its existence. I believe that it is capable of arising from long continued mechanical causes, such as the high intra-cardiac pressure which exists in anæmia. In this disease there is increased peripheral resistance with high blood-pressure. This leads to cardiac hypertrophy, with increased strain on the mitral segments, and mechanical injury to their free margins, while the heart, like the rest of the body, is badly nourished. Frequent emotional excitement, and palpitation from any cause, give rise to similar results. In these cases the whole segments are more or less thickened, and the insertions of the chordæ tendineæ are especially so; but you do not get the ring of vegetations which is such a common concomitant of a rheumatic origin.

Mitral stenosis is more common in females than in males, from the simple reason that rheumatism and chorea occur more frequently in girls than in boys, and anæmia and all emotional disturbances have a special predilection for the female sex. However, men are much more liable to the disease than is generally supposed, and in fact the disease is much more common among both sexes than is usually recognised; this frequently arises from the fact that it is often overlooked when associated with mitral regurgitation.

The disease is slowly progressive, and although sooner or later it usually leads to the death of the individual, yet under judicious treatment it is very slow in its progress, and is quite compatible with a fairly long existence. I have known several cases where it must have been in existence for more than a quarter of a century. There is at present under my care in the Northern Hospital a man suffering from advanced mitral and tricuspid stenosis, and he never knew that there was anything the matter with his heart until a few months ago; yet the

lesions probably started in an attack of rheumatic fever twenty years previously. For the last twenty-five years he has been engaged as a porter, and he has had regularly to lift weights from half to one hundredweight, and carry bales on his back of two and a half hundredweight. I believe in this case the tricuspid stenosis has been a conservative lesion, and has saved the heart and lungs from many strains to which they would otherwise have been subjected if the mitral lesion had alone existed. I pointed out this effect of tricuspid stenosis in a case which I recorded in the *Liverpool Medico-Chirurgical Journal* in 1884.

In cases of mitral stenosis occurring in early life the orifice usually assumes the funnel form, and this no doubt arises from the fact that such cases are usually of rheumatic origin, and the edges of the valve segments are primarily affected. From mechanical causes, such as violent collision of the segments and uniform fluid pressure, the edges of the valve get gradually thickened and united together, so that eventually we get a hollow cone tapering down into the cavity of the ventricle. Regarding mitral stenosis in the adult, Dr Sansom tells us: " The funnel form of constriction of the mitral orifice in children is much more common than the button-hole, the proportion being eight to one. This contrasts strongly with the condition as observed in adults. In sixty-two post-mortem examinations recorded by the late Drs Fagge and Hayden only three presented the funnel form. Dr Fagge found forty-six examples of the button-hole to one of the funnel." My experience would scarcely lead me to such extreme conclusions. I have shown three hearts from adults to-night, all of which present the funnel form, and all the valves were in a fit state for developing sound.

It is true that one of the orifices is a narrow slit or button-hole, but it is a button-hole at the end of a funnel. The characters of the orifice and valves depend perhaps more on the age of the lesion than on the age of the patient, and also on the causes which have given rise to the disease. If there be much fibroid thickening of the whole valve, and of the auriculo-ventricular ring, or if there be much atheromatous degeneration with calcareous deposit, then you are certain to have more or less

puckering, and the orifice assumes the button-hole variety. These conditions occur more readily in adults, and in them the lesion is frequently of long standing. In some cases the mitral segments are so thickened and contracted that they merely form a transverse septum, with a narrow orifice between the auricle and ventricle. In such cases the chordæ tendineæ are frequently thickened and matted together, and the musculi papillares are in such a fibrous condition that it would seem impossible for a first sound to be generated at the mitral orifice. This, however, is the exception, and not the rule; even in cases where the orifice is extremely small and its edges much thickened, the valve curtains are usually in a sufficiently vibratory condition for developing sound. The insertions of the chordæ tendineæ are spread over the greater part of both cusps, and the musculi papillares are usually thick, so that tension is vigorously applied to the whole valve. In one of the hearts which I show you to-night, if you pull on the musculi papillares, you will find that the only part which is not rendered tense is the thickened fibrous orifice. The relatively small quantity of blood in the left ventricle does not muffle the first mitral sound, which is directly conducted to the chest-walls through the chordæ tendineæ, musculi papillares, and part of the heart causing the impulse. The character of the first sound at the apex affords valuable evidence as to the condition of the mitral cusps.

In the gradual development of mitral stenosis, I have spoken of the violent collision of the mitral cusps setting up and maintaining cell proliferation, and welding together the edges of the valve segments. To this some may reasonably object, as it is generally held that the cusps come into gentle apposition during the repletion of the ventricle, and the first sound is one of valve tension rather than of collision. No doubt this is quite true under normal conditions, with only moderate resistance to the outflow of blood through the aorta; but with high intracardiac pressure the valve is subjected to something more than normal strain, and during an attack of violent palpitation, which may shake the whole chest, the dull thud of the first sound represents something more than valve tension, and this exces-

sive strain cannot be repeated indefinitely without more or less damage to the structure of the valve.

Diagnosis.—When we hear at the mitral area a presystolic murmur, or even a murmur during the long pause, it is a very simple matter to recognise the fact that there is some obstruction to the flow of blood from the auricle to the ventricle, but such an observation cannot properly be called a diagnosis. We want to know the nature of the obstruction, the size of the orifice, and the effect on the general circulation. Any observer can recognise a presystolic murmur, but it requires some training to interpret its significance. A good many men base their diagnosis of the lesion on the presence of the characteristic murmur, and as it is absent in a large number of cases, they thus frequently fail to recognise the disease, even in the very extreme and most urgent cases.

In a considerable number of cases where the murmur is well pronounced, the interference of the physician is uncalled for, but in many of those cases where the murmur is absent, judicious treatment may be of vital importance. In many cases the only murmur heard is a mitral systolic, due to regurgitation. Now, in my opinion, the treatment of these two affections is, in many respects, essentially different, and the failure to recognise the underlying condition of stenosis may be fraught with great danger to the life of the patient.

The character of the presystolic murmur and the first sound may help us to estimate the nature of the mitral orifice; but it is only by an examination of the pulse, and a careful study of the effects of the obstruction, that we can arrive at the far more important calculation of the size of the orifice, or amount of obstruction.

Of all the signs of mitral stenosis, the murmur is the most obtrusive, and, therefore, has perhaps received undue attention, to the neglect of other more constant, and, to my mind, more important signs. The characters and varieties of the murmur have been so well studied and depicted by numerous writers, that very little new can be said on the subject, but, nevertheless, the intensity of the murmur prevents our passing it over in

silence in a paper dealing with a lesion in which it plays such a prominent feature. There is, perhaps, no cardiac murmur about which such a conflict of opposing opinions has been waged. Even the very rhythm of the murmur has been disputed; but, at last, we have arrived at such an unanimity of opinion that it is now universally conceded, with the exception, I think, of only two writers, that the murmur occurs prior to the systole of the ventricle. Dr Gairdner happily designated it auricular-systolic, which implies a theory as to causation as well as rhythm. It has been objected to this name that the auricle is often so thin and dilated as to be incapable of any effective contraction, and the objectors substitute the theory of elastic recoil of the auricle, forgetting that under such circumstances there can be no recoil of the auricle, and under no conditions can the auricle be compared to the aorta, or to a distended india-rubber ball. The atrium may be so thin and dilated as to be incapable of any forcible contraction, but it is very rare for this to happen with the auricular appendix, and the injection arising from its contraction may be sufficient to give rise to a murmur. When the muscular contraction of the auricle is so weak as to be unable to give rise to a murmur through the narrow or roughened orifice, it is not an imaginary recoil which can do so. Under these conditions there is no murmur, or it occurs at an earlier period, owing to the suction action of the ventricle. When you get a rough, rasping, low-pitched murmur immediately preceding the first sound, it must be due to the contraction of the auricle, and is, therefore, auricular-systolic.

A murmur may arise under any conditions which are capable of giving rise to a *fluide veine*, hence, it is not at all surprising that it does frequently arise before the auricular systole from the blood rushing through a narrow orifice during the active dilatation of the ventricle. The suction power of the ventricles is a matter of very ancient history. It was advocated by Langrish, and afterwards by the illustrious Haller; but it was not until 1878 that this force was expressed in millimetres of mercury pressure by Goltz and Gaule.

The suction power of the ventricle is much aided by the

high blood-pressure within the pulmonic circuit. Dr Gaird-
ner recognised and described the murmur as occurring at
different periods, and even during the whole period, between
the second and first sounds. These different varieties of
murmur have been named by Dr Bristow, *early diastolic,
mid-diastolic, late diastolic,* and *entire diastolic.* The *late
diastolic* corresponds to the *presystolic of Fauvel* and the
auricular-systolic of Professor Gairdner. The *early dias-
tolic* may be purely mitral in origin, but I am convinced that it
is often confounded with a short, soft blowing diastolic murmur,
which not infrequently occurs in this disease at the moment
of closure of the pulmonic valve, and which arises from slight
regurgitation into the right ventricle, owing to the high pul-
monic tension. This murmur is usually very short, but I have
known it to be prolonged well into the long pause, and nearly
up to the first sound. The occurrence of the *early diastolic*
and *mid-diastolic* mitral murmurs depends on high blood-
pressure, a narrow orifice, and the aspirating force of the left
ventricle. The size of the orifice and the nature of the valve
segments will largely influence the character of the murmur as
it occurs at any part of the diastolic period.

At a very early stage of mitral stenosis, when the further
progress of the disease may be very largely modified if not
arrested, the characteristic murmur is usually absent, or there
may be only a mitral systolic murmur. Again, the murmur
may be absent in the very late stage, when much can be done
for the comfort of the patient, and when it is most important to
diagnose between mitral stenosis and mitral incompetence. I
think, therefore, we should be able to recognise the disease
independently of any murmur.

Enlargement of the Left Auricle.—One sign to which I
attach considerable importance is an extension of the cardiac
dulness in the direction of the left auricle. Under normal
conditions a line drawn from the centre of the suprasternal
notch to the nipple, or to a point on the left fourth costal car-
tilage where the nipple should be, and which, for convenience,
I call the suprasterno-mammillary line, should mark the left

outer border of the heart. Any extension of the cardiac dulness beyond this line in the direction of the outer part of the infra-clavicular region should raise a strong suspicion of mitral stenosis. This portion of the heart is usually well overlapped by lung, and so it requires very delicate percussion to elicit the extreme margin.

I may here premise that the whole deep cardiac area should be carefully mapped out; we want to know the size and position of the whole heart and of its individual parts. The anterior surface is to a greater or lesser extent overlapped by lung, and so in every case the percussion note of the deep cardiac area is only relatively dull; and in order to get the first shade of dulness, we should, in my opinion, percuss *very gently* from without inwards. In this delicate percussion I think it is a mistake to interfere with the slight vibrations of the chest walls, and therefore I prefer an ivory pleximeter to the finger. When you wish to bring out the slight dulness or impaired note of the lung in the very early or hyperæmic stage of pneumonia, then the vibrations of the chest walls should be stopped by the whole left hand laid firmly on, and the middle finger percussed. In this way you avoid the confusion arising from the resonance of the vibrating chest walls, and you obtain the further information of the resistance to the stroke. In the case of the heart, however, it is not a question of resistance or even of dulness, but of variation in the percussion note. It is a very good exercise to percuss out the cardiac dulness in the cadaver and compare that with the actual area occupied by the heart. The cardiac dulness is usually given much too small. If you take two such standard works as those of Dr Byrom Bramwell and Dr Sansom, and compare the pictures of the cardiac dulness with the areas occupied by the heart in the post-mortem room, you will be very much struck with the difference. Turn the lungs aside, and you will find the anterior surface of a normal heart is about as large as one of their cases of extreme hypertrophy. In none of Dr Sansom's plates of cases of mitral stenosis is there any extension of the cardiac dulness beyond what I have termed the suprasterno- (or simply

sterno-) mammillary line. This, I believe, is not because it was not there, but because it was not marked out. This careful differentiation of the cardiac dulness has yielded valuable results in my hands, and I hope that others will find it worthy of accurate observation.

I have at present under my care a male patient suffering from mitral and tricuspid stenosis in a very marked degree, but there is no great extension of the dulness in the direction of the left auricle. Here the comparatively small amount of blood passing through the narrowed tricuspid orifice is carried on without causing great distension of the left auricle.

The pulmonic second sound is accentuated. The intensity of this sound at the pulmonic cartilage largely depends on the amount of lung intervening between the artery and the chest-walls. Frequently the sound is better heard lower down over the conus arteriosus or right ventricle. In a certain number of cases, there is a short, soft, diastolic murmur (to which I have before alluded) in the pulmonic area, due to slight regurgitation through the pulmonic orifice. This is especially apt to happen when the right ventricle is dilated, and does not completely empty itself during systole. At the end of ventricular systole, the high tension in the pulmonic artery drives a certain amount of blood back through the closing valves into the unemptied ventricle. Some think this impossible, as the valve is usually found competent at the autopsy, but there is a remarkable difference between the pressure of one or two inches of water and the pulmonic tension in a case of mitral stenosis. I have recently had under my care a mother and her daughter, both of whom were suffering from acute rheumatism, mitral stenosis, pulmonic regurgitation, cardiac failure, and anasarca of the lower extremities. The mother had, in addition, tricuspid stenosis. Both made a good recovery, although that of the mother was rather protracted. The husband (and father) is at present suffering from acute rheumatism, but he has no cardiac affection.

Doubling of the second sound of the heart is a very common phenomenon in mitral stenosis. It is not by any means a pathognomonic sign, as some have supposed it to be, but merely an

exaggerated expression of a normal doubling which can frequently be heard at the end of inspiration or commencement of expiration, and, like the normal doubling, the second element of the double sound is invariably pulmonic. One of the most marked cases of double second sound with which I have met has recently occurred in a slater who had much ladder climbing. He was suffering from alcoholic asthenia, with dilatation of the right side of the heart, and dropsy. Under the influence of digitalis and strychnine, the doubling soon disappeared. The duplication undoubtedly arises from asynchronous closure of the aortic and pulmonic semilunar valves, and this does not directly arise, as is often assumed, from variations in blood-pressure in the aorta and pulmonary artery respectively, but is due to asynchronism at the completion of the left and right ventricular systoles. A relatively large quantity of blood in the ventricle, and heightened blood-pressure in its artery, necessarily protract its systole, and so delay the recoil of its artery with closure of the valve. In normal doubling, and in cases of mitral stenosis, the right ventricle is overloaded, and the resistance in the pulmonic artery increased, hence the right ventricular systole is protracted, and the closure of the pulmonic valve occurs appreciably after that of the aortic valve. On this point Dr Sansom mixes up my views with those of Dr George Balfour, and accredits me with statements which I have long since tried to prove erroneous. The views of Dr Balfour on normal doubling, which are ascribed to me, have long since been discarded by two such eminent authors as Dr Byrom Bramwell and Dr George Gibson in favour of mine. Doubling of the second sound is an important fact, and its interpretation, in any individual case, is usually very easy, if you will content yourself with the simple intelligible theory which I have enunciated. In many cases of mitral stenosis this phenomenon is absent where you might expect it to be present. This is especially apt to be the case when the right ventricle is failing, free tricuspid regurgitation taking place, or the ventricle not emptying itself during systole. Under such circumstances, the right ventricular systole is not protracted beyond that of the left, and so there is no doubling.

Its absence, therefore, may be of more grave significance than its presence. We should, therefore, not view it as a certain sign of mitral stenosis, nor fail to recognise that lesion when the sign is wanting.

The fact that the double second sound is frequently more marked over the right ventricle than at either the pulmonic or aortic cartilages has been urged against the theory of its asynchronous origin, but the site of the greatest intensity of the normal second sound is also very variable. Some years ago I examined 100 healthy males in Kirkdale Prison relative to the sites of greatest intensity of the cardiac sounds, and I found that in over 50 per cent. the second sound was loudest over the right ventricle. If the pulmonary artery is uncovered by lung, even the normal second sound appears very accentuated, and the closure of the valves may be felt as a distinct snap, but a good padding of elastic lung tissue interferes very materially with the conduction of the heart's sounds. The mitral first sound may be well conducted to the parietes through the impulse, even when the point of impact has been entirely formed by the right ventricle; but then the aortic second sound is likely to be absent at this point, owing to the interposition of a dilated right ventricle. The facts of each individual case should be examined in the light of the conditions present, and not by the theoretical considerations of the examiner. The sound, whether single or double, is best heard at the point of the chest to which it is best conducted through some solid media. Frequently, with one bell of a differential stethoscope at the aortic and the other at the pulmonic cartilage, a double second sound can be heard when only a single sound is heard at either point.

A double first sound is not an infrequent, nay, it is a common event in mitral stenosis. It is not put down as a sign in our text-books, nevertheless it is a fact. It is very difficult to account for this, as it must have been heard hundreds of times by every experienced auscultator. The only explanation which I can give of this want of recognition of a matter of daily occurrence is the fact that this doubling of the first sound in mitral stenosis is frequently associated with a rolling or tumbling

acting of the heart which renders the sounds very complex and difficult to analyse. You may have a double first and a single second sound, or a double first and a double second sound for one carotid or one radial pulsation. This does not arise, as some have asserted, from one half of the pulsations not reaching the periphery, for if you examine a sphygmographic tracing you will find one or more small beats in the down stroke, and it is just with *each* of these small interpolated systoles that the peculiar phenomena of three or four sounds occur. In the sphygmogram a strong vigorous pulsation starting from the base line corresponds to a quiet even synchronous systole of both ventricles. This may be followed by a tumultuous rolling and apparently forcible action of the heart, but the pulsation at the wrist may be barely perceptible to the fingers, and only recorded in the sphygmogram as an abortive systole. What, then, is the cause of these small pulsations in the down stroke, as the action of the heart (or rather of its right side) is perhaps so powerful as to shake the præcordium? The explanation of those who object to any asynchronous action, that it arises from the systole being so weak as to be barely more than able to raise the semilunar valves, is thus rendered as feeble as the pulsation at the wrist. If the cardiac sounds associated with this tumultuous rolling action of the heart and with each abortive pulsation are carefully analysed, the following result will be obtained, and for the sake of clearness of explanation I shall discard the consideration of any murmur which may be present:—There will be first heard a clear, short, sharp, but not very loud first sound (which I believe to be tricuspid in origin); this is quickly succeeded by a dull, low-toned, short sound (which I consider of mitral origin). Then, after a short but appreciable interval, there may be a dull feeble sound (which I ascribe to the aortic valve), or this sound may be absent or coincide with a fourth sound by which it is quickly followed. This last sound is the loud accentuated pulmonic second sound. All these phenomena are often heard over the right ventricle, close to the ventricular septum, or the double second sound may require to be analysed at the aortic and

pulmonic cartilages. In these cases, when there is an auricular systolic murmur, it is usually absent during these revolutions, or it may occur as a slight rumbling noise between the two elements of the double first sound, and certainly always after the first element. When there is a mitral systolic murmur it universally succeeds the second element, and like the sound is short and feeble, as it arises from the abortive contraction of a half-filled ventricle. The rolling action of the heart is felt over the right ventricle, but as the two ventricles again assume their synchronous action the impulse is transferred further to the left, and the first sound becomes loud, sharp, clear, and banging, quite distinct from the short, sharp, clear sound previously associated with the tricuspid valve.

These abortive systoles are usually explained by a supposed propagation of the wave of contraction from a distended left auricle to the left ventricle before the latter is half full; but in 1886 I advanced the view which I had long held, that the wave of contraction is not propagated from the auricle, which in many cases is so dilated as scarcely to contract at all, but from the right ventricle. In all obstructive cardiac lesions the effect tells backwards in the course of the circulation; therefore in mitral stenosis the cavities first affected are the left auricle and the right ventricle, which tend to become hypertrophied and dilated. There is also engorgement of the right auricle of all the viscera, and of the whole venous system. On the other hand, the left ventricle remains a comparatively small cavity, always provided that there is no aortic lesion nor any free mitral regurgitation, and consequently can only throw a small quantity of blood into the aorta at each systole. This small supply to the arterial system does not demand a great holding capacity, and so all the systemic arteries become exhausted, and thus the arterial tree is diminished, while at the same time the venous engorgement prevents a free outlet through the capillaries and arterioles, and thus the arterial pressure is raised. We have thus high pressure in both circuits; but it is relatively greater in the pulmonic circuit in proportion as the obstruction is comparatively greater and the area smaller.

Again we have a comparatively large right ventricle and a small left; the former contains more blood, and therefore tries to discharge more at each systole; but, of course, in a given time no more blood can pass through the right ventricle than that which leaves the left; therefore the extra effort of the right is used up in maintaining high pulmonic tension, which, with the aid of the left auricle, drives the blood forcibly through the narrowed mitral orifice during diastole. The very high pulmonic pressure and overloading of the right ventricle often tends to prolong the contraction of the right ventricle beyond the short, sharp, and effective systole of the left, and thus we get asynchronism in the closure of the two sets of arterial valves, with consequent doubling of the second sound. The large distended right ventricle never completely empties itself during systole, and frequently the discharge is so slight that it is again quickly distended, and thus initiates contraction, which is propagated to the left ventricle before it is full. This contraction may get so far ahead of the left ventricle that the systole of the latter may be induced before it contains much more blood than is sufficient to raise the aortic valve, and thus we may have one or more abortive pulsations in the down stroke. This goes on till the right ventricle has disposed of its superfluous charge of blood, and then the rhythm may become quite regular until it is again over-distended. This over-distension of the right side with initiation of contraction in advance of the left, in some cases takes place in a regular rhythm, so that we get the so-called pulsus bigeminous, trigeminous, &c.

On auscultation of the heart this asynchronism at the commencement of mitral contraction may be so slight that the mitral first sound becomes merged in that of the preceding tricuspid sound, and thus we only get a long first sound; or the asynchronism may be so great that we get a regular tumbling action of the heart, and there may be two first sounds, with one or two second sounds for a carotid pulsation, as I have explained. This peculiar action is most easily observed when the cycles are infrequent. The sequence of events may be

briefly described as follows:—Starting with a forcible con-
traction of the left ventricle, which is evidenced by a strong apex
impulse, loud mitral first sound, strong pulse, and well-marked
aortic second sound; this full discharge well fills the arterial
tree, keeps the arteries full between the beats, and produces a
very gradual down stroke in the sphygmogram. The con-
traction of the right ventricle which accompanies this complete
systole of the left may only partially empty its distended
cavity. Its first and second sounds are synchronous with
those of the left side, but less pronounced. The partially
emptied right ventricle is quickly recharged, initiates con-
traction which is propagated to the left ventricle, which is now
only partially filled. In this case the systole of the right
ventricle is the most powerful; its impulse strongest, and
sounds loudest. This may only occur as an occasional irre-
gularity; or, on the other hand, the right systole may keep
in advance of the left for several cardiac cycles, so that you
have an equal number of beats recorded in the sphygmogram
before the lever reaches the base line. What is felt in the
pulse as an intermission, or an irregularity in force and
rhythm, or is recorded in the sphygmogram as one or more
abortive pulsations, is represented in auscultation by an
irregular tumbling action of the heart, or a loud thump,
followed by one or more irregular rolling motions. When the
mitral orifice is very much contracted, you may have a tricuspid
first sound, then a mitral first sound, followed by a single second
sound; or this may be resolved into aortic and pulmonic
elements for one carotid pulsation. This peculiar rhythm of the
heart, with corresponding irregularity in the pulse, is increased
by digitalis and caffeine, and lessened by nitro-glycerine and
atropine. It is also relieved by such agents as lessen the
venous engorgement.

Although this peculiar action is very pronounced in mitral
stenosis, it is by no means limited to that disease. It may arise
when the innervation and balance of blood-pressure in the two
sides of the heart is disturbed from any cause. It is frequently
associated with dilatation of the right side of the heart, as

occurs in emphysema, &c., fatty degeneration of the heart, and atheroma of the coronary arteries. It is not uncommon in the infiltrated or degenerated fatty hearts of elderly people affected with an acute blood poison, such as that of erysipelas, septicæmia, or diphtheria. It may occur in gout, either active or latent, but, as a rule, in these cases there is usually a true intermission; the whole heart comes to a standstill for one cycle. In many of these cases the peculiar rhythm directly arises from the fact that the right side of the heart is usually more susceptible to stimuli than the left. I have known the right auricle to respond to stimuli four hours after the rest of the heart had ceased to beat.

I have hitherto avoided any complication of the question by a disquisition on the innervation of the heart, and perhaps it is not even now necessary to do so, because whether we believe that the muscle has in itself the inherent power of rhythmic contraction, or that those contractions are brought about by rhythmic discharges of nerve energy, we are all pretty well agreed that it is the stimulating effect of blood distension which induces those contractions, or rhythmic discharges. We know that the length of ventricular systole depends on the amount of blood to be driven, the power of the ventricle to drive it, and the resistance in front. If, then, the commencement of systole depends on distension, and its length on very varying factors, it would be very strange if the two sides of the heart were incapable of acting to a slight extent independently. When the balance of blood-pressure in the two sides of the heart is disturbed, it would be a very extraordinary provision in nature if one ventricle had to wait on the other, or prolong its contraction, not in accordance with the work it had got to do, but in accordance with the necessity of its fellow. Both sides of the heart are set to the same time, and from the interlacement of muscular fibres any complete asynchronism is impossible; but still one side of the heart may commence or end contraction before the other. Although in mitral stenosis the right ventricle invariably initiates the contraction, yet in many other conditions the left ventricle acts in advance. It is very amusing to read the

arguments of those who object to the theory of the asynchronous origin of double sounds. They argue that asynchronism is, in their opinion, impossible, and therefore it does not occur. It would be much better to find out whether it occurs or not, and then let the explanation follow. It either is, or is not, a fact, and the positive evidence which has been adduced by myself and others cannot easily be set aside by negative arguments.

My friend Dr Sansom, after quoting my views as to doubling of the first sound, admits the possibility of asynchronism, in order, I presume, to let me down gently, as he immediately proceeds to say that " Physiologists who have devoted years of their lives to investigations on living animals, have said that they have never observed such want of concord in the contractions of the ventricles as to render the theory of non-synchronous sounds of closure of the valves possible, and the cardiographic evidence in cases of rhythmic disturbance of the heart in all forms with which I am acquainted is conclusive that the left ventricle repeats its contractions in all cases, and that the two ventricles do not contract independently." I am not aware that any one ever asserted that they contracted independently with such asynchronism as exists between the auricles and ventricles. The asynchronism necessary for the doubling of the sounds occurs only at the beginning and end of systole. I believe I am not the only one who has asserted that he has seen, felt, and heard asynchronous action of the two sides of the heart, and it will take something more than negative arguments to dispel our supposed illusions.

The Character of the First Sound in Mitral Stenosis.—The first sound is usually loud, clear, sharp, abrupt, and banging or thumping. It may be described as a thud, resembling the accentuated pulmonic second sound, only nearly twice its length. Certain recent writers, among whom may be mentioned Sansom, Soltau Fenwick, and Overend, have conceived that the mitral valve is not in a condition to generate sound, and therefore they conclude that this more or less characteristic sound is produced by the tricuspid valve. I think it might have been well if they had made certain of their premises before arriving at such

a hasty generalisation. In the three hearts which I have exhibited to-night there is nothing whatever to prevent the mitral valve from generating sound, although one of the orifices only admits the little finger, and another only the tip of that finger. The chordæ tendineæ are not only inserted into the margins of the cusps, but are spread over the segments. If you take one of these hearts and pull on the chordæ tendineæ, you will find that the only part of the valve not rendered tense is the free thickened margin. Here during systole the whole valve would be rendered *taut*, with the exception of the lax and rigid orifice, which admitted of free regurgitation. I do not deny that in many cases the valve is so crippled and rigid as to be incapable of generating much sound, but these are just the cases in which the characteristic first sounds are absent. When the first sound is doubled, its first clear, short, sharp element of tricuspid origin is very different from the loud booming first sound heard during the quiet action of the same heart. The character of the murmur also affords valuable evidence as to the nature of the segments and the orifice.

The Pulse is very variable. When the compensation of the right ventricle is fairly well maintained, then the pulse is infrequent, slow, small, firm, and fairly regular. When the mitral orifice is very much contracted it becomes very small, infrequent, weak, and irregular, both in force and rhythm, with numerous interpolated systoles. When the right ventricle is much dilated, failing in power and free regurgitation through the tricuspid orifice, then the pulse becomes frequent, quick, small, weak, and very irregular in force and rhythm. Interpolated pulsations in the down stroke of the sphygmographic tracing are present in all cases of marked stenosis. These pulsations represent complete systoles, and never occur before the aortic notch in the primary or subsequent pulsations. The left ventricle contracts on a small quantity of blood which may be barely sufficient to raise the aortic valve, thus producing a very abortive pulsation in the down stroke, or it may be enough to raise the lever of the sphygmograph to its normal height, and maintain the ordinary pressure in the arteries. You may

have even five or six of these pulsations recorded in the sphygmogram before the lever reaches the base line.

Condition of the Lungs.—As a result of the chronic over-loading, with heightened pressure of the pulmonary circuit, we get increased cell proliferation and diapadesis of the blood-corpuscles, giving rise to the condition termed brown induration. In some severe cases the lung tissue becomes quite tough and leathery. There is also usually bronchial catarrh, and not unfrequently hæmoptysis. Those lung changes give rise eventu-ally to complementary emphysema. The lung symptoms frequently become so prominent as to obtrude themselves on the attention, and obscure the underlying and primary mitral affection. Such a case is at present under my care in the Northern Hospital.

Congestion of Pulmonic Lobules.—In the majority of cases of mitral stenosis, if you carefully percuss the back you will find small, circular, and oval areas, varying in size from about that of a shilling to a crown-piece, of comparative dulness. Over these areas the breathing is harsh and slightly tubular, and frequently inspira-tion is accompanied by a few crepitant râles, and the heart's sounds are often clearly conveyed. These little areas of dulness arise from congestion of lobular tracts of the pulmonic vessels. The dulness is never absolute, and the areas themselves are apt to vary from day to day, some clearing up, and others becoming established. These dull areas especially occur when the patient has been lying on his back, and they readily clear up when he is moving about. This sign I discovered about twenty years ago, and it is one to which I attach considerable importance. The percussion note is only relatively dull, and it is best elicited by delicate percussion on the pleximeter; there should be no interference with the gentle vibration of the chest walls.

The Liver and Spleen.—The liver is passively congested, and, in fact, the whole venous system is engorged. The hepatic dulness may extend below the level of the umbilicus, but the spleen is not usually much enlarged.

The Veins of the Neck.—There is frequently visible pulsation in the veins of the neck, especially when the patient is recum-

bent, due to regurgitation through the tricuspid orifice; and when there is also tricuspid stenosis, this pulsation becomes double, being both auricular systolic and ventricular systolic in rhythm. In tricuspid stenosis, the tension in the veins of the neck is also much higher than in mitral stenosis alone.

Dropsy does not occur until there is failure of the right ventricle, and, unlike that in cases of mitral regurgitation, it frequently begins as an ascites. I have fully explained the cause of this difference in my work on the "Pathology and Treatment of Dropsy," and need not again deal with it here. Patients suffering from tricuspid stenosis are particularly liable to hydrothorax when dropsy sets in.

The Size of the Orifice.—I am in the habit of weighing all the factors in each case, and then mentally estimating the size of the orifice. In the three hearts which I have shown you to-night my diagnosis has been absolutely verified. In one case I estimated the stenosis to be slight, just to admit two fingers; in another case I said that the orifice would barely admit the tip of my little finger. The last case died rather unexpectedly; and when I went down to the hospital one day lately, I found his body being carried out of the ward. I then recollected that although I had made frequent examinations of him, I had not recently made any note of his case. I then told Dr Oldmeadow that I estimated the size of the mitral orifice to admit the point of my little finger: you can now see the first phalanx of my little finger wedged in the opening. On looking over my notes of the case I find that the following was my diagnosis twenty-one months before his death:—"We have here a case of long-standing mitral regurgitation, which is now to a large extent being gradually replaced by mitral stenosis, owing to fibrous contraction of orifice and fusion of valve curtains. The character of the pulse would now indicate that regurgitation is not very free, while at the same time its volume would seem to indicate that the contracted orifice would still admit two small fingers. As a consequence, we have long-standing pulmonic congestion with evidence of brown induration, and to a certain extent
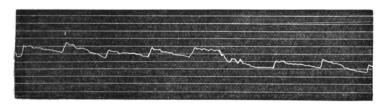
carnification of lung, and also emphysema along anterior margins. Right ventricle has become considerably dilated, and the tricuspid orifice incompetent, &c." I may mention that in this case there was never any presystolic murmur to assist the diagnosis. The circumference of my little finger (and of the orifice) is $1\frac{3}{4}$ inches, and of my little and ring fingers (which are rather larger than two small fingers) is $2\frac{5}{8}$ inches. If, therefore, my first diagnosis was correct, the orifice became one-third smaller during last twenty-one months of his life.

Embolism is not an infrequent sequence in cases of mitral stenosis. I believe that it usually arises from the formation of thrombi in the left auricle, rather than from the detachment of vegetations on the valve. The left middle cerebral artery is a common site of a plug, and then we get aphasia and right hemiplegia. The usually soft and unorganised nature of the plug renders treatment more successful. I have at present a case of this kind under my care where the aphasia and hemiplegia are rapidly disappearing under the free administration of ammonia and alkalies.
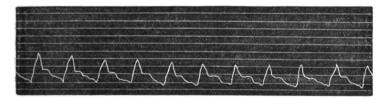
Sometimes I am afraid that I am apt to refine too much, and diagnose commencing mitral stenosis when really none is present; but as I recognise the fact that, if present, the stenosis in such cases must be very slight, and as my treatment is calculated to prevent its development, the refinement cannot do much harm. Dr Gairdner says, "the only way you can be certain of anything in medicine is to accept only positive evidence." In these cases the evidence is certainly positive, but it might be considered by many of a very flimsy character. The following brief notes will serve to illustrate this class of cases.

Miss T., aged twenty-five, sent to me by my friend Dr Logan, complains of indigestion, pains at occiput, infrequent and scanty menstruation, cold extremities, palpitation on much exertion, such as running upstairs, but can walk quickly on the level. No history of rheumatism or of any other serious illness. Heart's area enlarged, measuring seven inches transversely and five inches in depth. The extension is in the direction of the right side of heart and left auricle. No

murmur or thrill, and the first sound at the apex is not accentu-
ated, loud or booming. The second sound is rather accentuated
at the pulmonic cartilage, but it is not double. There is a
quasi-doubling of first sound at the commencement of inspira-
tion, but no rolling or tumbling action. There are no lung
symptoms. The hepatic and splenic dulness are about normal.
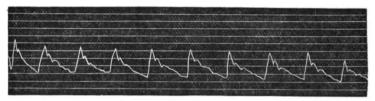Pulse small and firm, infrequent, slow, moderately high
tension.

The following tracing was taken after two weeks' treatment,
when all her symptoms had improved :—

Mrs N., aged thirty-six. She has always been a very nervous
woman, and suffered frequently from palpitation when a girl.
She never had rheumatism or chorea. She is now a spare,
healthy-looking woman, but complains of shortness of breath
on exertion, and is often troubled with expectoration of tough
mucus in the mornings. She is very nervous, and she is
troubled frequently with leucorrhœa. She has never had any
swelling of her feet. Her abdomen has been large and flabby
since the birth of her first child, but there is no ascitic fluid,
and no enlargement of the liver or spleen. Heart's dulness
large, measuring six and a half inches transversely, and extend-
ing in the direction of the left auricle, about one inch beyond
the sterno-mammillary line. Heart's sounds clear, and heard all
over the cardiac area ; second sound rather accentuated at the

pulmonic cartilage and over right ventricle. No murmur nor doubling of either sound. The veins of the neck are rather full, but do not pulsate. There are a few dull patches, with harsh breathing, over the posterior aspect of both lungs. Pulse regular, firm, and moderately strong.

I have referred to normal doubling of the heart sounds : a condition, the very existence of which many writers dispute, is well exemplified in the following case :—Miss R., a very fine, well-developed, vivacious, healthy young lady—a nurse in the Northern Hospital—height, 5 feet 10 inches ; weight, 11 stones. She has always enjoyed good health, but informs me that her pulse is usually slow, and she has an occasional sensation of fluttering or slight palpitation of the heart when running upstairs. When the following observation was made she had been two days in bed, suffering from fatigue and neuralgia, consequent on heavy nursing. At the end of expiration or very commencement of inspiration, the first sound was double, the first element being distinctly associated with the right

ventricle and the second with the left. The two elements followed one another in rapid succession, and frequently became merged to form one long first sound. At the end of deep inspiration there was very marked doubling of the second sound, the elements being separated by an appreciable interval. Here the first element was aortic and second pulmonic. Her pulse was only 48, and the above tracing exhibits in a

marked degree the effects of respiration. It only required 2½ ounces pressure to develop the tracing.

It will be noticed that during expiration there is a fall in the base line, which might seem to indicate, as some have asserted, that there is a fall in the arterial pressure; but a careful inspection of the individual curves will show that the pressure is actually heightened during expiration, and the dip in the base line is due to the long drawn-out diastole, allowing of a more complete emptying of the arteries. There is nothing the matter with this lady's heart.

Treatment.—I have entered very fully into the treatment of this affection in my papers in the *Liverpool Medico-Chirurgical Journal* of 1886 and 1887, but must now further elucidate this important subject. I may premise that there are few chronic diseases so amenable to treatment and so compatible with a comparatively long life of comfort if judiciously handled.

In the early stages of mitral stenosis, when the contraction of the mitral orifice is not great, a slight hypertrophy of the left auricle and right ventricle may be sufficient to maintain the cardiac balance. We should then lessen the high arterial tension which is usually present, so as to obviate all strain on the mitral valve, and thus prevent the development of the stenosis. The tension is best lessened by the administration of salines and alkalies, moderate exercise, a light diet, with little fluid. In these cases there is generally a rheumatic tendency, and the mode of life should be prophylactic, against the development of acute attacks of rheumatism. The patient should be warmly clothed with flannel next the skin, and he should avoid all vicissitudes of climate. When at any time the feet are damp or the body wet and chilled, the clothing should be changed and the surface circulation re-established as quickly as possible. The action of the skin should be maintained, and for this purpose daily ablutions are necessary. A morning bath, at a temperature from 60° to 80° F., according to the susceptibility of the patient, with coarse friction afterwards, will be found very advantageous. The combustion within the system should be as thorough as possible, and with this end in view the patient

should avoid all close, heated atmospheres, and live as much as possible in the open air. A warm, dry climate is the best. He should live at not too great an elevation from the sea-level, so as to obviate the effects of a rarefied atmosphere, which leads to pulmonary congestion, and further tasks an already overworked right ventricle. The life should be at a low level, not merely so far as the earth's surface is concerned, but in every other respect, and free from all mental worry and care. The patient should be enjoined to "pursue the even tenour of his way" in a happy and contented frame of mind, and simple pleasurable emotions should not be forbidden. Marriage cannot be recommended; and especially in the case of a female, a timely counsel against wedlock and its usual results will be advisable. When the disease is advanced, even strong emotional excitement, irrespective of childbearing, is highly injurious. Some years ago I tried to dissuade a young lady from matrimony, but to no purpose. About twelve months afterwards, under a little over-exertion and domestic anxiety, her heart gave way, and I was called down to Wales to see her dying from cardiac failure, and hæmatemesis. However, I have known many non-emotional women, suffering from mitral stenosis, to bear large families. Pregnancy and parturition largely increase a woman's risks under these conditions, but still she can usually be carried safely through her troubles. A few years ago I saw, with my friend Dr G. G. Stopford-Taylor, a woman in the last days of gestation, who was apparently dying from mitral stenosis, with cardiac failure. We discussed the propriety of inducing premature labour, but determined to try the effect of treatment first. She received immediately a hypodermic injection of $\frac{1}{25}$ gr. of atropine, followed by a dose every three hours of one minim of liquor atropinæ sulph., and one minim of a one per cent. solution of nitro-glycerine. She got 5 grains of calomel, and all fluid was absolutely interdicted. In a few hours she was comparatively comfortable, except for the effects of the atropine, and two days afterwards was safely delivered. She made a good recovery.

Some years ago I saw, with Dr Bowen, a patient affected with

mitral stenosis, who, after her confinement had a large thrombus carried from the uterine sinus and lodged in the pulmonary artery. She was suffering from urgent cardiac dyspnœa, livid, cold, bathed in perspiration, and almost pulseless. Under the influence of five minims of liquor ammoniæ fort. every half hour the clot gradually disappeared, and she made a good recovery. The case was published in the *Liverpool Medico-Chirurgical Journal* by Dr Bowen. In all cases of blood-clotting there is no remedy equal to strong solution of ammonia, which was first recommended in such cases by Sir B. W. Richardson.

Short of actual fatigue, a fair amount of exercise, even to the extent of climbing hills, will prove highly beneficial, by favouring the circulation, increasing the combustion, and improving the general nutrition. The skeletal muscles contain about a fourth of the whole blood of the body; and this exercise greatly increases the circulation through them, and so increases the capillary area. On the other hand, if they be not used, they require very little nutrition; comparatively little blood passes through them, as it tends to flow in the direction of least resistance; thus the capillary area is diminished, and the general arterial tension increased.

The food should be light and nutritious, with a fair proportion of vegetables, and no meal should be so heavy as to unduly distend the stomach. The food should merely be sufficient in quantity and quality to maintain healthy nutrition. I am in the habit of advising my patients to drink as little fluid as possible, never more than two pints a day; and if the tissues be at all flabby, or there be any venous turgescence, I frequently reduce them to half this amount. All fluids drunk have to pass through the circulation before they are excreted, and any excessive amount only handicaps the right side of the heart without producing any benefit. I know that some physicians like 'to drench their patients, with the view of washing away effete products, but it is a much wiser plan not to produce more effete products than can be excreted without flushing. The regular use of all alcoholic drinks should be strictly interdicted. Tea, coffee, and cocoa may be left to the discretion of the patient,

except so far as quantity of fluid is concerned. With some practitioners milk is an universal food for all the ills to which flesh is heir, but I do not recommend it for rheumatic or gouty patients, and in cases of mitral stenosis it has the further disadvantage of being a liquid food. Tobacco should be forbidden. In this early stage of the disease drugs are unnecessary, except for some complication which may arise, or some failure in compensation from excessive strain or other cause. There is usually not much anæmia, so that iron is not often required, but when prescribed it should be combined with a laxative, and preferably with one which acts on the liver. I have shown that mitral stenosis not unfrequently arises in anæmic conditions, and so that cause or associated condition of the lesion should be removed.

If the rules which I have laid down be strictly adhered to, the disease may make slow progress and the patient enjoy many years of a very comfortable life, but the lesion has a progressive tendency, and as the mitral orifice becomes smaller, disturbances in the circulation are more easily developed, and the secondary effects become more permanent. The further treatment of the case, beyond the general plan which I have already indicated, will mainly depend on the nature of the complications which arise.

When any indication of failure of compensation in the right side of the heart occurs, there must be no fashionable treatment by graduated exercise on a mountain side, but the excellent old-fashioned restorative of rest in bed must be at once adopted. If the disease be in an early stage, a few days' rest, a dry diet, and a cholagogue cathartic may be all that are required to restore the *status quo ante*. If a long stay in bed be deemed advisable, then *massage* should be substituted for the loss of active muscular exercise. This improves the circulation in the muscles, increases the quantity of blood in the systemic vessels and so indirectly lessens the pulmonary engorgement, and it hastens the return venous current.

There is more or less constantly high tension in the pulmonary circuit, and in my article on the " Etiology of Aneurism "[1] I have shown how this leads to atheroma ; in fact, the only marked

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[1] *Liverpool Medico-Chirurgical Journal*, July 1881.

atheroma which I have observed in the pulmonary veins has been in cases of mitral stenosis. This pulmonary engorgement dilates the left auricle, causes bronchial secretion, and eventually leads to brown induration of the lungs, with more or less destruction of lung tissue. These conditions are best obviated by reducing the fluid in circulation, and keeping as much of that as possible in the systemic vessels by the methods which I have already indicated. The lungs may become so engorged that nature seeks relief by a profuse hæmoptysis, and in these cases this is the most direct and best method of blood-letting. Instead of appreciating the efforts of nature, it is no uncommon thing to see the physician attempt to stop the hæmoptysis at all hazards. The patient is plied with gallic acid, ergot, or acetate of lead, which leads to arterial contraction, with still further engorgement of the lungs, and perhaps a fatal issue, if nature does not assert her right by a still more copious blood-letting. In these cases some propose to relieve the right side of the heart by free venesection of the veins of the arm, but they fail to see that you cannot syphon the blood backwards, but you only withdraw it in the course of the circulation from the arterial system, which already contains too little. If you wish to blood-let, you can only do so with any degree of efficacy from the hæmorrhoidal veins, which are in immediate communication with the inferior vena cava. In a very urgent case it might perhaps be permissible to perform the operation suggested by Dr Westbrook of aspirating the right ventricle. Such cases, however, are best treated by brisk catharsis with saline purgatives; sweet spirits of nitre, or small doses of nitro-glycerine, to increase the capacity of the systemic arterioles and capillaries, and thus indirectly relieve the engorgement of the lungs; lessening the quantity of liquids ingested, so as to diminish as far as possible the fluid in circulation; and then employ such a hæmostatic as turpentine, which clears out the blood lodged in the air vesicles. I now wish to add another mode of blood-letting by aspirating the liver. Those who have seen cases of death from asphyxia know what an enormous quantity of blood that organ is capable of containing, and how greatly and rapidly

it may thus become enlarged. That an analogous condition exists in cases of mitral stenosis is well known, though this chronic congestion may and does lead to a form of cirrhosis, in which cases the blood will not be so readily abstracted. Therefore depletion of the liver is easily practised in proportion to its size. When there is hæmoptysis, there may be failure in the compensation of the right ventricle, but its force remains fairly good, because when its contractile power is greatly diminished, or there is free regurgitation through the tricuspid orifice, the intra-pulmonary pressure at once fails; therefore hæmoptysis affords an indication for relieving the pulmonary engorgement rather than the right ventricle. This, no doubt, could be readily done by bleeding from the arm or jugular, or even more directly by opening an artery, if there were free communication through the mitral orifice, which would enable the left ventricle to withdraw the blood from the lungs as quickly as it pumped it out at the open vein or artery; but there is not; hence we must content ourselves with the rational lines of treatment which I have indicated. With the diminution of the quantity of blood in the lungs, the distension of the left auricle is lessened, and so its contractile power is better able to assist in carrying on the circulation.

In mitral stenosis, so long as the force of the right ventricle remains effective and there is no bronchitis, the blood passing through the lungs is well oxygenated, the left ventricle drives its bright red blood well into the systemic capillaries; hence patients usually present a florid, healthy appearance, and have not that livid, dusky hue which is so common in cases of mitral regurgitation. Once there is marked failure of the right ventricle the blood does not pass freely through the lungs, and the left ventricle does not receive a sufficient quantity of oxygenated blood to maintain the systemic capillary circulation. The blood accumulates in the lungs and left auricle, the right ventricle becomes greatly dilated, the tricuspid orifice incompetent, the right auricle distended, the greater part of the blood accumulates in the venous system, so that the veins, down to the minutest radicles, become overloaded; the work of the left

ventricle is increased, which now perhaps, through failing nutrition, gets also dilated; the circulation becomes stagnant, the mucous membrane livid, countenance bloated and dusky, surface cold and even death-like. There is usually very little anasarca, because there is no extra blood or excessive pressure in the systemic capillaries. The whole venous system, including the liver and portal circulation, is engorged, and when there is free tricuspid regurgitation the dropsy not unfrequently begins as an ascites. Here you have got not only the overloading of the whole venous system, which necessarily begins in the most distal veins, due to the mitral disease, but also a positive forcible backward impulse against the advancing current, which necessarily first tells on the large mass of blood in the vena cava and such main branches as the hepatic veins. The impulse may cause the whole liver to pulsate, and anyhow it obstructs the portal circulation, and may thus give rise to ascitic effusion. (I have dealt with this point in my article on the " Pathology and Treatment of Dropsy," in this *Journal*, July 1886, so need not refer further to it here.) There is urgent orthopnœa, the radial pulse is quick, very small, weak, and irregular. The sphygmograph shows that, while the arterial tension may be comparatively high, only a slight pressure is required to obliterate the pulse, its volume is small, duration short, and many of the beats fail to reach the wrist or are only recorded as interpolated pulsations in the down-stroke. The dilated right ventricle struggles ineffectually, but it may be violently, especially if the failure in compensation be due to overwork or acute strain before there is degeneration of its muscular fibre, to perform its task. The action of the heart is tumultuous and the principal impulse over the right ventricle; the rhythm is very irregular, and presents the characteristics to which I have before referred. There may be a single first sound followed by a double second, or sometimes a double first followed by a single or double second sound. There may be a strong impulse of the heart due to the right ventricle accompanied by a weak pulse or absent beat at the wrist indicating a feeble left systole. One or more weak pulse beats may succeed or be succeeded by a

· forcible contraction of the left ventricle. When there is almost absolute failure of the right ventricle, with free regurgitation through the tricuspid orifice, this peculiar irregularity of rhythm disappears : there is very little onward movement of the blood ; the left ventricle receives little and propels little blood ; the right ventricle is well supplied, but drives the greater part back through the dilated orifice ; the circulation then almost comes to a standstill, and eventually the heart ceases to beat.

Even in these extreme cases, blood-letting from the arm is generally spoken of and boldly advocated as the *dernier ressort*, but what good it can accomplish, save in the imagination of the operator, I fail to see. You only thus assist nature in emptying an already depleted arterial system, and so hasten the not far distant end. That the personal equation comes largely into play in observing the effects of treatment there can be no doubt, and in no class of cases more so than those under consideration. The sanguine operator generally thinks he sees the result he expected, and the consternated patient experiences the very temporary relief which he was told would take place. The motto would seem to be " draw blood," it does not matter from where or how, so that verily there would seem to be the danger of us falling into the errors of our forefathers.

When the right side of the heart is over-distended, so that it cannot effectively contract, there can be no doubt but that depletion is the most rapid and perhaps best method of enabling it to do so. In an urgent case, therefore, I would have no hesitation in aspirating the right ventricle or right auricle as suggested by Dr Westbrook of Brooklyn. In less urgent cases I would freely aspirate the liver or open the hæmorrhoidal veins. The right ventricle should be further relieved by brisk cholagogue cathartics. The action of the heart should be aroused by external warmth, sinapism to the præcordia, ammonia to the nostrils, and the internal use of such remedies as nitro-glycerine with atropine, ammonia, æther, or alcohol, these drugs to be given with as little fluid as possible ; when the patient is cold and pulseless, æther and atropine may be injected hypodermically.

When the urgent symptoms have been tided over it may be

necessary to give such cardiac tonics as digitalis, caffeine, convallaria, and strophanthus. As a cardiac tonic strophanthus is my favourite in mitral stenosis, digitalis in mitral regurgitation, to lessen the size and increase the force of the right ventricle, but they are usually better combined with some agent to lessen and more evenly distribute the work of the heart, such as nitroglycerine, sweet spirits of nitre, or alcohol. Atropine is a respiratory stimulant, a cardiac tonic, and also lessens peripheral resistance, and in some cases I have found small doses of it, with nitro-glycerine, to answer admirably. It must be remembered, however, that with advancing recovery and diminution of blood in the veins, it is not prudent to greatly dilate the systemic arterioles, which would thus allow too free an escape of blood through the capillaries into the veins, and keep the arterial pressure at a low ebb. About $\frac{1}{300}$ gr. of atropine, combined with a similar quantity of nitro-glycerine, three or four times a day, is usually sufficient; to this may be occasionally added 5 minim doses of tinct. digitalis, or tinct. strophanthi. Ammonia, caffeine, and nux vomica often prove a good substitute. As the case advances towards recovery I have seen a mixture of citrate of quinine and iron, digitalis, and strychnia, given for short intermittent periods, do good service. Convallaria is highly recommended by Dr Sansom.

It is now more necessary than ever to insist on the general principles of diet and abstinence from liquids which I have previously mentioned. *Massage* may now be used to improve the circulation, but it must not be used to hurry on the blood until the right side of the heart is relieved and the venous system depleted.

I have already incidentally referred to the effects on the liver and the great enlargement that organ undergoes, with subsequent contraction from cirrhosis, resulting from the chronic congestion. These effects are best obviated by limiting the amount of fluid ingested and so lessening the portal circulation, and by the regular employment of cholagogue cathartics.

The kidneys suffer in the general venous congestion, but in the early stages of the disease the arterial tension is good, and

hence the renal secretion is free. When failure of the right ventricle with tricuspid regurgitation takes place, the arterial pressure falls, the onward current of the blood is diminished, and the urine correspondingly lessened. As their improvement takes place there is a return to the former condition of affairs, with restoration of the renal secretion. The indications for treatment, therefore, are to improve the state of the right ventricle and that of the left will naturally follow, hasten the circulation, and maintain moderate arterial tension. Diuresis is evidence of improved circulation, and shows that the cardiac tonics are having a good effect.

Blood-letting is a valuable auxiliary in the treatment of heart disease, and is certain in the near future to be more generally used than it is at present. I rather regret to have to differ in some matters of detail from my sanguinary friends, but I think the subject of blood-letting is one which admits of free discussion, so that accurate rules may be formulated for the employment of such a powerful weapon — powerful alike for good or evil — in the treatment of disease. We must have a clear conception of the conditions which are benefited by blood-letting, and how, in any given set of conditions, the abstraction had best be performed. We must know why we bleed, when to bleed, where to bleed, and how much to bleed. In reading the histories of cases cured, relieved, and supposed to be relieved by venesection, it is often very apparent that the operator has got a very inadequate idea of any elementary principles to guide his action. You may read of a physician opening the median basilic vein, and drawing off perhaps a pint of blood, in a case of very high arterial tension, with immediate and lasting benefit to the patient. In perhaps the next case he performs the operation the arteries are almost empty, and it is with great difficulty that he can withdraw a third of the former amount. Yet both he and the frightened patient may imagine that the bloody deed has been fraught with great relief, though very probably the death of the latter may show that there has been no lasting benefit. When the bleeding is limited to such flea-bites as a few leeches, or dry cupping over the liver or præ-

cordia, there cannot be much harm done. I could never see the rationale of abstracting say 10 ounces of blood from the arm, and at the same time putting a pint of warm milk in the stomach. If physicians could only be taught to lessen the amount of liquid ingested in cases where the heart is over-burthened with fluid, then venesection might often be dispensed with. Some time ago I was asked to see a patient who was sup-posed to be suffering from angina pectoris. He was propped up in bed, and breathing was laboured. There was great sense of oppression and pain about the præcordia, which caused him to be very restless, constantly tossing about and unable to get into an easy position. His countenance was anxious and dis-tressed, he moaned and sobbed with anguish, cried for breath, threw his legs out of bed, and could obtain no relief. His liver was much congested, digestive functions disturbed, and bowels confined. His pulse was frequent, large, of good strength, full and bounding; all the veins were turgid, face dusky, mucous membranes livid, skin hot, and perspiring freely. He had been in this condition for about forty-eight hours, during which time he had had no sleep, and the case was now looked upon by those in attendance as well-nigh hopeless. He had been treated for two days with nitro-glycerine, nitrite of amyl, a liberal allowance of brandy, which induced thirst, and this was gratified by a free supply of liquids. I diagnosed the case as one of primary dilatation of the right ventricle from overwork. As the arterial system was well filled, and there was a free supply of blood from the lungs through the left side of the heart, I felt strongly inclined to relieve the right side of the heart indirectly through the lungs and systemic arteries, by free bleeding from the arm. However, I decided to give the following method of treatment a trial first:—At my suggestion, the alcohol, nitro-glycerine, and nitrite of amyl were stopped, and the fluids were much diminished. He got 4 grains of calomel, followed by an ounce of sulphate of soda, which was repeated after some hours. He soon experienced considerable relief, and towards the morning he had about two hours' sleep. He progressed very favourably, but before he was quite convalescent he was rather indiscreet in his

diet and drink, which brought on a relapse. This was quickly relieved by the same method of treatment. He next got a mixture of caffeine and ammonia, afterwards digitalis and nux vomica, which again were replaced by strophanthus. He was put on a light dry diet, with only about one pint of liquid in the twenty-four hours. He was soon allowed to have exercise, which he was ordered to gradually increase, so that in a short time he was able to do a hard day's work. I have recently learned that he has since kept quite well and strong. I have not the slightest doubt but that bleeding would have done this patient good, but the removal of 20 ounces of blood from his arm would not have been a whit more effectual than the mode of depletion which I adopted.

Regarding nitro-glycerine and atropine (two drugs of which I have spoken highly in the treatment of mitral stenosis), I may say that I always prescribe them in small does— $\frac{1}{200}$ to $\frac{1}{50}$ of a minim of the former, and $\frac{1}{200}$ to $\frac{2}{100}$ gr. of the latter, sometimes separately and sometimes together, and the frequency of the doses is decided by the effects produced. When I hear of a dose of 10 minims of a 1 per cent. solution of nitro-glycerine having been prescribed, I suspect that there was something wrong with the drug. Sooner than adopt such a practice I would try a few doses of the mixture on myself, and if the physiological effects were not produced I would change the druggist. I may also remark that in mitral stenosis it is not desirable to reduce the peripheral resistance too low, lest you produce worse effects than those you are trying to remedy.

I could cite numerous cases in support of the contentions in this paper, but it has already assumed such dimensions that I must forbear for the present. However, a short abstract of my notes of the three following cases of mitral and tricuspid stenosis may be worthy of record.

CASE OF MITRAL AND TRICUSPID STENOSIS.

Jane O'H., housewife, admitted to the Northern Hospital, May 29, 1888, and was in hospital the greater part of the time until

her death on March 7, 1889. She had a bad attack of rheumatic fever three years before admission, and has not been well since. She had great ascites and was tapped frequently, and on each occasion over two hundred fluid ounces withdrawn. There was never any general anasarca. The following note was dictated by me, December 28, 1888:—

This patient has been recently in rather a precarious condition. She has been confined to bed, and complains chiefly of weakness and loss of appetite, but there are no distressing symptoms, and it is particularly noticeable that there is no dyspnœa. The ascitic fluid has considerably increased, and the border of the hard liver can be felt about 2 inches below the margin of the ribs. Tongue slightly furred. Appetite poor. Bowels kept open. *Pulse* small, short, and infrequent, and presents the following peculiarity of rhythm: there is a moderately strong beat, quickly followed by a weak, scarcely perceptible beat, and this is occasionally succeeded by another small beat. After a long pause there is a moderately strong beat to begin another cycle. The total number of pulsations is about 48 per minute.

There is considerable enlargement of deep cardiac dulness, the extension being chiefly in direction of right ventricle and left auricle. The apex beat is in the sixth interspace, five inches to left of mesial line, and the extreme left margin is about 1 inch further to the left. The right border is 3 inches to right of mesial line, giving a total transverse dulness of 10 inches. The highest part of upper margin extends from the first left interspace, and gives a vertical dulness of about $5\frac{1}{2}$ inches. At the apex beat the following peculiarities of sound are heard over cardiac area. At apex the rhythm is very slow, only about 24 first sounds to the minute. The first sound is tolerably clear and definite, and unaccompanied by any murmur though occasionally somewhat prolonged and having a murmurish character. This is quickly followed by a dull second sound which, after a perceptible interval, is followed by a loud, harsh, rasping murmur which begins very intensely, gradually dies away into a soft blowing sound. After a long interval this is

succeeded by a first sound. As each revolution is $\frac{1}{24}$ part of a minute, the different occurrences roughly may be stated to occupy the following relative duration of time :—

First sound about $\frac{2}{10}$ths ⎫
Second sound „ $\frac{1}{10}$th ⎪
First pause „ $\frac{1}{10}$th ⎬ of a revolution.
Murmur „ $\frac{3}{10}$ths ⎪
Second pause „ $\frac{3}{10}$ths ⎭

At the aortic cartilage there is a dull first sound followed by a reduplicated second sound, the first element of which seems relatively the most intense. Quickly succeeding this there are usually heard two sounds of about equal intensity, and following one another in rapid succession. At the pulmonic orifice the rhythm seems occasionally pretty regular, there being about 48 dull first sounds followed at the rate of 48 sharp second sounds per minute. It is to be noted, however, that even when most regular, the rhythm occurs usually in cycles of two beats, the pause between which is very short, while there is a considerable interval between the cycles. In connection with the second beat of each cycle, the second sound is occasionally double. Over the right ventricle the rhythm is similar to that heard at the pulmonic orifice, but a systolic murmur accompanies the first sound, and a diastolic murmur is also heard over this area. This condition has been from time to time during the examination subject to variations which need not here be detailed.

We have here got a well-marked case of mitral and tricuspid stenosis, the mitral orifice being especially contracted so as barely to admit the tip of the little finger. The first sound at the apex is connected with a perfect systole of the left ventricle, which is represented in the radial artery by a strong pulsation. The loud, harsh, rasping murmur dying away into a soft blowing sound is, no doubt, presystolic and systolic, obscures the first sound, and is the result of a second systole of the ventricle. During the long pause the left ventricle was completely filled, and hence we got a short, sharp, and

effective systole with strong pulse to begin a new cycle. The action of the right ventricle is much more even; but here the diastolic and systolic murmurs indicate tricuspid stenosis with incompetence. The great congestion of the liver and the marked ascites point to very free regurgitation through the tricuspid orifice.

At the *post-mortem* examination on March 9, 1889. The right side of the heart and left auricle were enlarged and dilated. The mitral orifice would barely admit the first phalanx of the little finger, and the tricuspid orifice admitted the thumb. The lungs were congested; liver very large and firm.

MITRAL AND TRICUSPID STENOSIS—DEATH—AUTOPSY.

Kate J., aged 14, re-admitted to the Northern Hospital, January 18, 1892. She had been in the hospital about five months previously with symptoms of mitral stenosis and incompetence. There was also general anasarca and ascites, of which she had been relieved, but she returned, and in a worse condition than on her previous admission. There was a history of rheumatism some years previously. On her reception on the last occasion there was effusion into both pleura, there was a large amount of ascitic fluid, and there was general anasarca. Mitral and tricuspid stenosis were diagnosis, and the general condition of the patient improved until February 5, when I dictated the following note:—

5. This patient became suddenly worse to-day about twelve o'clock, with considerable cardiac distress. The breathing is quick, and the heart's action rapid and excited. Her extremities are cold, and her mucous membrane and finger-tips are quite purple. The abdomen is considerably swollen owing to large liver and a certain amount of ascitic fluid. An examination of chest does not detect any evidence of pleuritic effusion, and over the posterior aspect of lungs breathing is harsh and percussion note rather impaired. There is no cough or expectoration.

Cardiac area very much enlarged, extending from $2\frac{1}{4}$ inches to the right, and $5\frac{1}{4}$ inches to left of mesial line, and reaches as
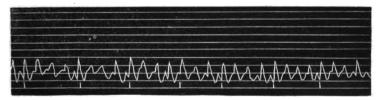
high as lower border of first rib. The dull percussion extends very much in direction of both auricles, and the great veins of chest are much distended. In the neck the veins are much enlarged—distended very tense and visibly pulsate. The pulsation seems vibratory and gives the impression of a double beat to every cardiac pulsation, though owing to very rapid action of heart (132 beats per minute) this is not very distinct. The tension of the veins, however, is much greater than would be expected in ordinary tricuspid regurgitation, and therefore independently of any supposed presystolic wave the impression is distinctly left that there is tricuspid stenosis as well as incompetence of the valve. Apex beat is very diffuse, there being a strong pulsation in fourth, fifth, and sixth interspaces, strongly heaving, and of a peristaltic character. The wave being from below upwards, and from left to right. During the impulse in sixth space, there is retraction of intercostals in the fourth and fifth. In fifth and sixth interspaces there is a long systolic murmur, while in fourth space this is preceded by a short rumbling presystolic murmur. In the tricuspid area there is a long soft blowing systolic murmur. In the pulmonic area there seems a short double murmur. The second sound is indistinct and partially replaced by a short whiff. This along with the other conditions of the patient leaves no doubt that there is a thrombus in right ventricle extending into pulmonic artery.

At the aortic cartilage the second sound is fairly distinct and not accompanied by any murmur. The heart's action although very rapid is fairly regular; the pulse at the wrist is barely perceptible, and in the carotid arteries it is small and weak, and not at all so distinct as in the veins of the neck. The superficial veins of abdomen and chest are generally enlarged and full. Hepatic dulness measures $7\frac{1}{2}$ inches in the axilla line, $7\frac{1}{2}$ in line of nipple, and $5\frac{1}{4}$ in line of sternum. Splenic dulness is an irregular oval measuring 5 by $2\frac{3}{4}$ inches. Liver feels very hard and firm. The urine is scanty and highly albuminous.
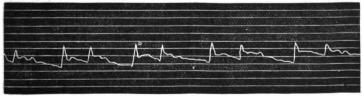
Diagnosis.—From a consideration of the whole facts of the case, I am led to infer that this child is suffering from mitral

and tricuspid stenosis. The mitral orifice being contracted so as to admit not more than my thumb, and the tricuspid about my ring and middle fingers. The amount of venous congestion of long standing might still further imply a still greater contraction of cardiac orifices above referred to; but in making a probable estimate of their sizes, it must also be taken into account that there is and has been free mitral and tricuspid regurgitation. As the result of this obstruction to the circulation, the lungs have been long congested, and now, no doubt, show signs of brown induration. Physical examination would show that this has not extended to any great degree. There is now no evidence of any pleural effusion. The hepatic dulness indicates a very much enlarged liver from chronic congestion, and the spleen slightly so. There is also a considerable amount of ascites; and the general anasarca, present on admission, has now to a great extent disappeared. The presence of a thrombus in right ventricle and pulmonary artery should also be noted.

Under the influence of five minims of liquor ammoniæ fort., every half hour for some days, she rapidly improved, and all evidence of the clot finally disappeared. The frequency of administration of the ammonia was gradually lessened, but its use was continued to February 17. The following tracing was taken from the external jugular vein on February 12 :—

The following pulse tracing was taken on May 25 :—

She died May 29, 1892.

May 30—*Autopsy—Abstract.*—Considerable anasarca, involv-

ing lower limbs and posterior aspect of body. A large amount of ascitic fluid, small quantity of thin fluid in each pleura, and 1 fluid ounce in pericardium. There is a slight amount of smooth lymph over the surface of both pleuræ, but no adhesions. Both lungs much congested and œdematous; cut firmly on section, and are carnified; right, 18 ounces; left, 15 ounces.

Heart weighs 13½ ounces. There is a very large " milk spot " near the apex, consisting of organised lymph or fibrous tissue raised above the cardiac surface. There are many white striæ, and a white patch over the right ventricle. All the cavities contain dark clotted blood, and in the right auricular appendix there is *a large well-organised clot.* The tricuspid valve is thickened, especially along the margins. *Orifice admits two fingers easily, barely three.* Pulmonic valves slightly thickened, but competent. Right auricle dilated; walls thin, except the trabeculæ of the appendix, which are hypertrophied. Walls of right ventricle rather thickened. Left auricle considerably dilated, and walls thickened, lining membrane opaque and atheromatous. *Mitral orifice admits Dr Barr's thumb;* cusps thickened, firmest at their margins; and along the auricular surface of the margins there is a beaded layer of lymph. The left ventricle is about normal size, walls hypertrophied. Aortic cusps thickened, and on ventricular surface rough lymph.

Liver weighs 43 ounces, well-marked nutmeg, thickened capsule (perihepatitis) over upper surface of right lobe. Spleen, 4½ ounces, firm on section. Kidneys, 7 ounces; capsules strip easily, slightly granular cortex.

Note.—The brother of this patient was under my care in the Northern Hospital in 1889, suffering from mitral and tricuspid incompetence. The case presented several peculiar features, and was recorded by our then house-physician, the late Dr Quintin Wallace, in the *Liverpool Medico-Chirurgical Journal,* January 1890.

CASE OF MITRAL AND TRICUSPID STENOSIS.

The following patient has been under my care in the Northern Hospital since August 30 :—Patrick N.,[1] æt. 40, labourer.

[1] Exhibited at the Medical Institution, December 21, 1893.

Clinical Abstract of Case.

History.—Rheumatic fever 20 years ago; right pleurisy 18 months ago; first symptoms of cardiac failure about 4 months before admission.

Present Condition—Mitral Stenosis.—Orifice about size of tip of little finger. *Tricuspid Stenosis.*—Orifice about admit thumb. Frequent doubling of first and second sounds; right side of heart acting slightly in advance of left; slight œdema of feet and ankles.

I dictated the following note on December 20, 1893 :—

This man is confident that he has had no rheumatism for the past 20 years. With the exception of right-sided pleurisy 18 months ago, has enjoyed good health. For the last 25 years has had laborious work as a porter, at times carrying weights from ½ to 1½ cwt., at times 2 cwts. Hours of work, 7.30 A.M. till 6 P.M. As regards alcoholic drinks has been temperate, daily allowance not being more than 1 pint of beer. He is and has always been a spare but muscular man.

Since admission general condition has improved ; the dropsy has disappeared, with the exception of slight œdema about the ankles when out of bed. Pulsation in the epigastrium has now almost disappeared; there is now no pulsation in the veins of the upper arm, but in the veins of the neck it is fairly well marked, and both presystolic and systolic in rhythm.

Cardiac dulness is very much enlarged, the extension being chiefly in the direction of the right cavities and of the left auricle, and extends 2¾ inches to the right and 5 inches to the left of the mesial line, and reaches as high as the second right and left costal cartilages.

Apex beat situated in the fifth interspace in the nipple line, gently heaving in character, and accompanied by a slight presystolic thrill. The heart's action is decidedly irregular in rhythm, and at different points on the surface can be heard a doubling both of the first and second sounds.

When sitting with his arms extended and elevated, the heart's action becomes rather excited, and the thrill better developed.

At the apex the first sound is dull, and is followed by a soft blowing systolic murmur, which runs well up to the second sound, which in this area is scarcely appreciable. Frequently at this point the first sound is double, the first element being short, clear, and sharp, while the second is dull and now barely accompanied by any murmur.
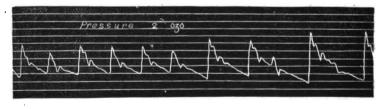
Over the right ventricle the first sound is invariably short, sharp, and clear, and frequently a double sound is heard, the first element preserving the usual characteristics, while the second element is a low dull thud; accompanying the first sound and first element of the double sound is a short and very soft blowing murmur of systolic rhythm.

At the pulmonic cartilage the first and second sounds are both distinct, the second being accentuated, and frequently doubled, the second element being the loudest.

At the aortic cartilage both sounds also distinctly heard, and of almost equal intensity; here the doubling of the second sound is not so manifest, but when heard the first element is evidently most distinct. There is general venous turgescence.
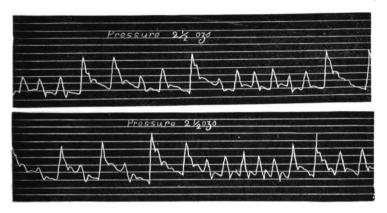
Respiratory.—Is not troubled with any pulmonary troubles, breathing being fairly normal over posterior surface of both lungs. Many small patches of comparative dulness can be mapped out, over which areas the breathing is harsh, and expiration slightly prolonged.

Hepatic dulness rather large, 5½ inches in the nipple line.

Splenic dulness, an irregular oval, 5 inches by 3½ inches.

Pulse about 60, markedly irregular in force and rhythm. Some of the beats are moderately large, full, and strong, and these are succeeded by small but moderately forcible pulsations. The blood pressure is fairly high.

Diagnosis.—The mitral orifice is evidently very much contracted, and probably would not admit more than the tip of my little finger; the valve segments are still in a condition for generating sound, although they must be considerably thickened and somewhat shrunken; there is no evidence of any

rough deposit on the segments, the margins of the orifice is thick, and the orifice itself remains patent during systole, admitting of slight but prolonged regurgitation.

The tricuspid orifice is also much contracted, and would probably not admit more than the first phalanx of my thumb; the valve segments may be a little thickened, but are fairly healthy, and generate a clear first sound.

The stenosis is, I presume, produced by a welding together of the valve segments, leaving a thickened orifice, which admits of slight regurgitation during systole. There is slight overloading of the pulmonary circuit, with perhaps slight "brown induration," otherwise the lungs are fairly healthy.

The liver and spleen are enlarged from chronic congestion.

No albuminuria.

It will be some time before this diagnosis is examined in the light of an autopsy. The patient has made great improvement while in hospital, and will soon be discharged.

CONGENITAL SARCOMA OF THE KIDNEY.[1] By F. T. PAUL, F.R.C.S., *Surgeon to the Liverpool Royal Infirmary.* (With Plate.)

NEXT to the Dermoid group of tumours the renal sarcomata are the most prominent and interesting class of congenital new-growths. Unlike the former, their tissues are markedly embryonic in type, and essentially malignant in character; like them they are heterodox in tissue, and complex in structure.

The congenital renal sarcomata, with rare exceptions, show themselves during the first few years of life, and are differentiated from the adult sarcomata not only by years, but by pathological characters. Between the ages of 5 and 30 malignant disease of the kidney is extremely rare. Cases are certainly on record, but they are only very occasionally met with. I have seen many on each side of this limit, but never one within it. The other essential points of difference are the frequent bilateral origin of the congenital growths, and their peculiar and complex histological structure. The term sarcoma, as applied to these growths, is in a certain sense misleading, for glandular elements are frequently present in them. However, in their mode of growth, and in the bulk of their histological structure, they resemble the sarcomata, and even when markedly of the adenomatous type, we have less reason than usual for excluding them from this group, when we bear in mind that the kidney itself is purely of mesoblastic origin.

The chief characteristics of the congenital renal sarcomata are these : —

(1.) They show themselves during the first five years of life, and are probably invariably of congenital origin.

(2.) They are primarily extra-renal, though usually intra-capsular, and they distend or surround the kidney in preference to infiltrating it.

[1] Read at the Pathological Section of the Medical Institution, Dec. 14, 1898.

(3.) In about half the cases they are bilateral.

(4.) They rarely cause marked urinary symptoms, or much pain, and are usually fatal by exhaustion or pressure effects.

(5.) They only occasionally give rise to metastatic growths; but some kinds freely infiltrate the kidney, and all recur when removed.

(6.) They frequently contain striped muscular fibre, and embryonic renal tissue, and almost constantly various kinds of adult connective tissue, such as white fibrous tissue, yellow elastic tissue, areolar tissue, and fat.

Typical ordinary sarcomata do not show themselves so soon after birth; the primary growth is single, and their structure is limited to one type of embryonic connective tissue. I cannot recall meeting with yellow elastic tissue, muscle, glandular tissue, or genuine normally formed adipose tissue in them, unless such tissues have been included during the invasion of the growth. So many, and so marked are the differences, that I think it would be a good plan to place the growths in question in a group by themselves, calling them simply " congenital renal tumours," and thus giving up altogether the name which causes them to be classed and considered with the adult renal sarcomata. In such a group as this the congenital cystic disease of the kidney would by some be included, though this at all events has nothing whatever in common with sarcomata. The congenital cystic kidney is said by the most recent writer, Mr Bland Sutton,[1] to be entirely independent of obstruction to the escape of secreted urine, and to be genuinely of the nature of renal adenoma. This, no doubt, is consistent with what we know of adenomata elsewhere. These growths repeat imperfectly not only the structure, but the functions of the organ in which they originate. Hence a watery secretion distending tubules into cysts is what one might expect of a renal adenoma. Congenital cystic disease of the kidney is, however, said by Shattock to arise from inclusion of the remains of the Wolffian body during the development of the permanent kidney; a view which is, as it seems to me, preferable to that of regard-

[1] *Tumours*, Bland Sutton, 1893.

ing this disease as being of the same nature as, for instance, adenoma of the breast. The cysts are very rarely localised and encapsuled in such a manner as to constitute a genuine tumour. Such a case was, however, met with by Dr W. Edmunds in a girl aged 18, and is recorded by him in the *Pathological Society's Transactions*, vol. xliii. p. 89. It is taken advantage of by Sutton to press his view that congenital cystic disease is only a form of renal adenoma. Usually the cysts are scattered more or less throughout one or both organs after the manner of retention cysts. They are lined with cubical or flattened epithelium, and vary in size from a pin's head to a pigeon's egg. We have some very good examples of this disease in the Medical School museum, two of which I have photographed to illustrate these observations.

A somewhat similar origin to that advanced by Shattock for the cystic kidney may be ascribed to the other examples of the group of congenital renal tumours; as, indeed, has all along been advocated by Cohnheim. The development of the kidney[1] is of a most complicated and intricate nature. No organ is more intimately associated with contiguous rudimentary structures, nor seems to be so much exposed to the risk of including them. A nephros, or head kidney, has been described; but, owing to the difficulties surrounding the investigation of the early human embryo, very little is known of the development, characters, and retrogression of this transitory organ. The mesonephros, or Wolffian body, is a comparatively large and important organ during early intrauterine life; and though its original purpose has been served, and it atrophies when the metanephros, or true kidney, comes into existence, both functional and functionless remains are preserved through life in the parovarium, and in the vasa efferentia, the coni vasculosi, the vas deferens, and the epididymis of the testis.

The Wolffian body is well known as one of the characteristic features of sections of early embryos. The duct first appears external to the protovertebral somites, as a derivative according to Kölliker of the epiblast, but according to Milnes Marshall

[1] See *Vertebrate Embryology*, by Professor Milnes Marshall, Victoria University.

and others of the mesoblast, like the rest of the genito-urinary glands. The duct is shortly followed by the appearance of the Wolffian body in the intermediate cell-mass between it and the somite. This structure rapidly develops into a functional urinary organ with tubules and glomeruli, which discharge their secretion through the Wolffian duct into the cloaca. The true kidney commences, like its predecessor, by the development of its duct, which buds about the early part of the fourth week from the hinder or lower end of the Wolffian duct near the cloaca. The ureter thus originated soon obtains a separate opening below, and at the same time grows forwards or upwards dorsal to the Wolffian body. Its upper end expands to form the pelvis of the kidney, and from this expanded part tubules bud out into the surrounding mesoblastic tissue of the intermediate cell-mass from which the Wolffian body itself was developed, and which now enters into the formation of the cortical substance of the kidney. At this period of evolution the two organs are in close contact, and may constantly be seen cut in the same section ; moreover, the intermediate cell-mass from which a large part of both are developed is all along intimately associated with the structures from which the muscles, bones, and connective tissues of the back are derived. It does not, therefore, seem at all remarkable that the elements of other tissues should occasionally be included within the capsule which forms around the embryonic kidney, and growing with its growth become evident at a later period as one of these congenital tumours. This, at any rate, seems to me to be the most reasonable explanation of the origin of these growths ; and, if it be true, their pathology is so distinct from adult sarcomata, that it cannot be correct to put the two into the same class, regarding them as mere varieties of the same species of tumour.

In 1883 I drew up for the British Medical Association a report upon the pathology of the new growths of the genito-urinary tract, in which these congenital renal tumours were classed as round-celled, fibro-, myo-, and adeno-sarcoma. This classification was in the main correct, and has been accepted by most English writers of monographs on the kidney since. But

later experience has convinced me that all these tumours are
very much of the same type, and that the differences of tissue
met with in them are at the most not more than sufficient to
constitute subvarieties.   They all consist primarily of embryonic
connective tissue.   In some this tissue is filled with small round
cells, and in this form constitutes the whole tumour.   In others
higher kinds of connective tissues are present, such as areolar,
elastic, fibrous, and adipose tissues, and notably striated mus-
cular fibre.   Again, in others embryonic renal tissue prevails.
It is true that when renal tissue prevails muscular fibres are
few, and when muscular fibres prevail renal tissue is often
nearly absent.   In my specimens the rule is that, when the
growth is of marked embryonic type, the tumour is round-celled
throughout, though from the grouping and character of the cells
one may venture the opinion that they are merely the higher
tissues in an embryonic state.   But when any form of higher
evolution is present all the various structures described are
generally to be found, though in very unequal quantities, if
sections be examined from many parts of the tumour.   Thus, I
think that this class of new growth may very well be simply
named the congenital renal tumour, and may be regarded as
closely allied to the dermoids in origin, particularly to those
known as the congenital, thyroid, and coccygeal tumours.   Tum-
ours containing striped muscle have been met with in other parts
of the body, such as the testis and ovary; and it is interesting
to note that these organs are developed from the same cells as
the kidney.

The following may be taken as typical examples of the histo-
logical structure of these growths:—

(1.) The simple connective-tissue type.   A tumour of this kind
occurred in a female child, and was first noticed at the age of
six months.   She died when a year old from exhaustion and
pressure effects.   The tumour weighed 6 lbs., the rest of the
body weighing 10 lbs.   It was partly encapsuled by normal
kidney, and contained degeneration cysts, one of which was
very large, and had yielded a pint of fluid to aspiration during
life.   Under the microscope, the young growth consisted of a

vascular embryonic connective tissue resembling that of an early embryo (Plate I. fig. 1); and it very clearly in other parts passed through the various stages of development of cellular tissue, showing first an intercellular fibrous stroma (fig. 2), and ultimately a perfect areolar tissue in which were well-grown yellow elastic fibres (fig. 3).

(2.) The complex connective-tissue type. The most recent example I have met with of this kind occurred in the practice of Drs Peirce and M'Aulay of Hoylake. The patient was a female child, who died at the age of one year, after the usual course of symptoms. The tumour had only been noticed between three and four months. I helped Dr M'Aulay to make a post-mortem examination. The tumour was situated on the right side, displacing the cæcum and colon, and to a large extent filling up the abdomen. It was pale and soft in structure, and would weigh about 4½ or 5 lbs., constituting probably nearly a third of the weight of the entire body, including the tumour. The upper part of the kidney was expanded over the growth, the rest of the organ being normal. There were no secondary growths. I brought away several pieces for microscopical examination. In some taken from the outer part of the tumour one could see a fibrous structure with the naked eye, which proved to be due to the presence of young striated muscular fibres. These structures are sometimes spoken of as striated spindles, and as having no sarcolemma nor longitudinal fibrillæ, thus implying doubt as to whether they are true muscular fibres. Mounted in Farrant, both cross striation and longitudinal fibrillæ are very plain, as, indeed, is all the structure and detail which can be seen in any mammalian muscular fibre at the same degree of development, which, in my experience, about corresponds with the condition of the chief muscles of an eight weeks' human embryo. In addition to muscle, I found in this tumour plenty of young adipose tissue, resembling normal fœtal fat (fig. 4), as well as other forms of connective tissue, and a small quantity of renal glandular tissue.

(3.) The renal adenoma type. As examples of this type, I have met with nothing better than two cases which I have

already published—one in the *Pathological Society's Transac-
tions*, 1886, and the other in the *British Medical Journal*,
January 1884. The former tumour was removed by the late
Mr Rhinault Pughe, at the Children's Infirmary, from a girl
aged two years and four months. The microscope showed that
the bulk of this tumour consisted of embryonic glandular tissue
(fig. 5). In its young state this tissue appeared simply as
broad trabeculæ of round cells; but every gradation between
this and perfect tubules, lined with regular epithelium, could
readily be traced; and though a casual observer might easily
have passed this tumour as a round-celled sarcoma, the round
cells were, as a matter of fact, all epithelial. In a few places
immature glomeruli were present. The tumour also contained
various forms of connective tissue, probably some very young
muscle-cells, and a few little specks of squamous epithelium.

In the other case the kidneys were symmetrically enlarged.
They weighed 6 ozs. each, and were taken from a seven months'
fœtus. The normal shape was retained, and they would fairly
well have passed for somewhat congested large white kidneys.
On section the cortex was deep, confused in structure, and
mottled in colour; the medullary part was infiltrated with
patches of a white colour; the texture was soft throughout.
The microscope showed that the remains of the kidney tissue,
both cortex and pyramids, was to be found in the outermost
layer of the enlarged organ; but only penetrating $\frac{1}{8}$ or $\frac{1}{10}$ of the
whole depth. Beneath this was a broad layer of confused renal
tissue, for the most part of a very embryonic character, more so,
for instance, than in a three months' fœtus, but consisting
entirely of tubules and glomeruli (fig. 7). Between this and
the pelvis the greater part of the tissue was composed of alveoli
filled with round cells; which, however, even on casual observa-
tion, could be seen arranging themselves into double rows and
circles, indicating that they were only a less developed stage of
the tissue just described (fig. 6).

So far as can be judged from recorded cases, the bilateral
tumours seem to be of the most infiltrating and malignant
character, sometimes giving rise to disseminated growths. They

are apparently also more rapidly fatal than unilateral tumours, and do not attain to anything like the size of the latter. How large proportionally to the body the single tumour may become is well shown by one of the cases referred to, in which the growth weighed three-fifths as much as the entire body, exclusive of the tumour. The accompanying photograph taken at the post-
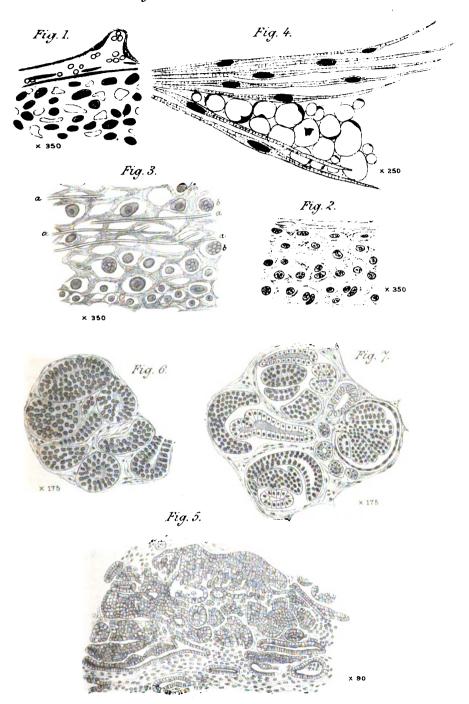

From a post-mortem photograph. A congenital renal tumour of the left side weighing 6 lbs. in a child aged 1 year. It shows the characteristic displacement of the colon, and the general interference which must have been caused to other organs by its immense size.

mortem shows its overwhelming size, and also the characteristic displacement of the colon. That all these congenital renal tumours are malignant is clearly established by a most valuable table drawn up by Mr Sutton,[1] in which he shows that out of thirty-five operations for the removal of renal sarcoma in children under six years of age fifteen recovered, but all died within a year from recurrence of the growth. Thus, however interesting it is to us as pathologists to study cases such as these I have brought forward to-night, it is a somewhat disheartening reflection that up to the present they remain hopeless from the clinical point of view.

[1] *Tumours*, Bland Sutton, 1893.

DESCRIPTION OF PLATE.

[Figs. 1 to 7. To illustrate Mr Paul's paper on Congenital Sarcoma of the Kidney. From drawings by the author.]

Figs. 1, 2, 3. The simple connective-tissue type of congenital renal sarcoma.

Fig. 1. Embryonic connective tissue from the young growing part of the tumour.

Fig. 2. The same more advanced in development, and having a fibrillated matrix.

Fig. 3. The same in an adult stage, with well-developed yellow elastic fibres (*a*), and droplets of fat in some of the cells (*b*).

Fig. 4. The complex connective-tissue type of congenital renal sarcoma. "Striated spindles" or young striped muscle-cells, showing both transverse and longitudinal striation, mixed with foetal adipose tissue. From the case referred to on page 107.

Figs. 5, 6, and 7. The glandular type of congenital renal sarcoma.

Fig. 5. Copied by permission from a drawing by J. R. L. Dixon, published by the author in *The Transactions of the Pathological Society of London*, 1886. Showing the evolution of the glandular tissue in the tumour referred to on page 108.

Fig. 6. Showing the structure of the white growth infiltrating the medullary part of the kidney in the case of bilateral tumour in a seven-months' foetus. A transitional condition between a simple round-celled growth and the complex glandular tissue of fig. 7.

Fig. 7. New renal tissue forming the bulk of the tumour.

Fig. 1.

× 350

Fig. 4.

× 250

Fig. 3.

× 350

Fig. 2.

× 350

Fig. 6.

× 175

Fig. 7.

× 175

Fig. 5.

× 90

ON URINARY EXTRAVASATION (Opening of a Dis-
cussion on the Subject). By CHAUNCY PUZEY, *Surgeon
to the Liverpool Northern Hospital.*[1]

DURING the spring and summer of 1891 my attention was
drawn to a curious run of cases at the Northern Hospital in
which there were the same distinguishing features, that the
patients were admitted for stricture, without retention of urine,
or with the degree of retention which was easily relieved by
catheterism performed by the house-surgeon, and in the
course of a few days more or less constitutional disturbance
drew attention to the perineum, which was found to be the site
of urinary extravasation. One case especially, which unfortu-
nately had a fatal termination, impressed me painfully, because
I felt that closer attention to the earlier symptoms and more
frequent watchfulness *might* have led to earlier operation, and
possibly to a successful result. This fatal case was constantly
in my mind for long afterwards, and led to my careful con-
sideration of the other cases of what I have termed a *masked*
extravasation. And I would suggest, at the outset, that the
mode of onset or origin of extravasation of urine is a subject
for a most useful discussion. As a rule, at all events in
hospital, the mischief has been far advanced when the patient
is admitted, and we have no practical experience of the earlier
history of these cases; and I think the text-books are some-
what misleading in their account of the manner in which acute
extravasation occurs. I hope to succeed in explaining my
meaning as I go on.

And now, in the first place, I will shortly describe a typical
case of acute gangrenous extravasation—the worst case, in fact,
which I have ever seen recover. I may as well say now that,
with one exception, all the cases which I shall mention have
come under my care within the last *three years;* and I only
propose to speak of a certain number of these.

[1] Read at the Liverpool Medical Institution, October 19, 1893.

EXTRAVASATION OF URINE—GANGRENE OF SCROTUM—OPERA-
TION—TREATMENT IN BATH—RECOVERY—SUBSEQUENT
PLASTIC OPERATION.

Thomas Cahill, æt. 48, admitted April 2, 1891. History
of stricture for several years; swelling of scrotum and penis for
about a week; but urine passed with increasing difficulty until
the morning before admission.

There was great swelling of scrotum and penis, the swelling
extending over pubis and into right groin, which was dusky
red. A large portion of the scrotum was black; in fact, looking
like decomposing liver. There was great constitutional dis-
turbance.

An hour after admission the man was etherised, and a free
incision made down the middle of scrotum and perineum, and
a large quantity of stinking urine and pus mixed with blood
flowed freely away. The scrotum was so rotten that it was
torn, and two large pieces were cut away; the tunica vaginalis
being completely exposed.

Hæmorrhage was checked by cautery.

Next day and the day after, it was found necessary to freely
incise the groins and abdominal walls towards the loins, the
fascia being found sloughing, and even the muscles slightly
involved.

Three days after admission, it was found impossible to keep
him clean in any way; so he was put into one of Dr Barr's
tank beds; and this was without doubt the means of saving his
life. He was kept in it for a week, soaking in boracic acid and
sanitas solution, and at the end of a week all the sloughs had
separated. A full-sized catheter could now be passed all along
his urethra, and eventually he made a capital recovery.
On May 7 (five weeks after his admission) I had to perform
a plastic operation for the purpose of covering his right testicle,
which was completely bare of all covering, except of tunica
vaginalis. This was successfully done; and I showed the
patient at the Medical Institution on one of the clinical
evenings last year.

This man, of course, had a narrow escape; but I suppose he was a healthy subject, and especially that his kidneys were sound. In every fatal case which I have had the opportunity of examining post-mortem, the kidneys were badly diseased.

The next case I relate is the one I referred to in commencing my paper. It appears interesting and instructive in several ways. First, it illustrates how easily a limited periurethral abscess may be overlooked; secondly, the rapidity with which the sudden diffusion of foul urine into the cellular tissues may cause all the destructive effects of caustic alkali locally, whilst the absorption of the septic fluids and gases may cause intense collapse, and fatal septicæmia; and thirdly, as a corollary, how imperative it is to be on the watch for the earliest appearances of even slight extravasation; while the mischief may be confined to a limited locality.

Thos. S. This was the case of a man, æt. 56, who was admitted under my care on May 20, 1891, after I had made my visit. I did not see him until the 22nd, and then I was told that it was a case of cystitis, and that there was no difficulty in passing a catheter (and washing his bladder out). Now it happened that about that time my then colleague, Mr Hamilton, and myself had both had cases, sent in or admitted as cases of cystitis, where we had found limited deep perineal extravasation. So I examined this man. I thought, in fact I felt certain, that there was in the posterior scrotal portion of the urethra some *slight* fulness to be felt. It was so slight that I remember the house-surgeon on duty said he could not distinguish it. I left word that this point was to be carefully watched, and that I was to be telephoned to if the fulness appeared to be spreading. Next day, 23rd, hearing nothing, I did not see the man; but next morning, 24th, the house-surgeon telephoned that there was considerable swelling of the perineum and scrotum. When I arrived at the hospital early in the afternoon, I was horrified to find the perineum and scrotum universally swollen and deep plum coloured; and on incisions being made it was too evident that extensive gangrene of the scrotum and perineum had already occurred. Of course, the usual procedures

were adopted, and the bladder drained. But the man never
seemed to rally from the shock; and although he lived for five
days longer (until the 29th), he never showed the slightest
attempt at improvement.

I have no doubt his kidneys were diseased. I cannot other-
wise account for there being no attempt at reaction. He was
a very delicate-looking man, of apparently as little mental
strength as of physical; and that, perhaps, had something to
do with the fatal termination.

But the case I regard as one of very great importance as a
lesson.

In the majority of surgical works extravasation of urine is
represented as taking place as a result of retention of urine and
of violent straining to overcome this. Now it seems to me, as
a result of my observation, that there are numerous exceptions
to this rule, and that the non-recognition of these exceptions
is calculated to lead to mistakes such as I have just alluded to.
You will perceive that cases *do* occur where an instrument can
be passed into the bladder with facility, the urine regularly
drawn off, and yet, of course from some form of ulceration
taking place behind the stricture, leakage may occur, and most
serious consequences ensue.

Now I would suggest as one subject for discussion to-night—
What is the mode of inception of these extensive and destruc-
tive extravasations? If you look into the text-books and
surgical dictionaries, you will find the same story told of how
a patient who has long suffered from stricture and retention
some day, while straining to pass urine, feels something give
way, which gives him relief, and that, sooner or later, he feels
an unpleasant warmth in his perineal region, and that this has
been the result of the sudden bursting of his urethra. I should
like to know, does that coincide with the experience of the
surgeons who are here to-night? If the account given in books
is misleading, it is likely to lead to disaster, because extravasa-
tion in its earlier stages may thus be overlooked.

In referring to the unfortunate case of Thos. S. just now,
I mentioned that I examined his perineum, because we had

met with several cases where patients were admitted for cystitis, and in the course of a day or two more or less extensive perineal swelling had been met with, and extravasation found.

The following case is an instance of the way in which extravasation of urine may be going on without the patient complaining of any symptoms of urinary trouble.

Robert M'Ardle, æt. 44, was admitted under the care of my colleague, Dr Barr, for bronchitis. Three days after admission extravasation of urine was discovered, with commencing gangrene of scrotum. I at once laid open his perineum, and passed a large drainage-tube into his bladder. The man had rather a rough time; for a few days he had symptoms of uræmia, with low delirium, and temperature up to 105°; but these symptoms subsided under the influence of vapour baths, and of hot irrigations of the bladder; and finally, the man left the hospital quite well after ten weeks' treatment.

Here is another case, James Kenna, æt. 53. This man said he had had difficulty with his urine for, he thinks, ten years. For a long time he had had dribbling of urine, though he could pass a certain quantity voluntarily. Eight days before admission he noticed a swelling in the scrotum, but did not do anything for it, and lay in bed for a week before sending for a doctor, who promptly sent him to hospital. He had enormous swelling of penis, scrotum, and perineum. The usual free incisions were made, the remains of a perineal abscess being quite distinct. In this case the destruction done in the deeper parts of the perineum and in the direction of the prostate was so great that, although I passed a full-sized catheter through the penis into the wound, I could not find the way into the bladder. Drainage, therefore, went on through the wound. Several days elapsed before a catheter was passed on into the bladder.

I should hardly have related this case but for its curious termination. So far as my experience goes, the recovery of these bad cases depends mainly on the condition of their kidneys. In the case of this man Kenna, when he was looking at about his worst, I was asked whether he had any chance of recovery, and I said that if his kidneys were sound he would

get well. But he did not; and yet a post-mortem showed his kidneys in very fair working order. He died of acute peritonitis, due to his gall-bladder giving way and pouring out its contents (gall-stones, &c.) into his peritoneum. This occurred six weeks after the operation, when the patient had so far recovered from his original disease that he was passing nearly all his urine in a good stream through the penis, the perineal opening being all but closed.

And now, by way of variety (and as an exception to rule), let us contrast these cases with one which came under my care at the Northern Hospital many years ago.

The house-surgeons told me they had admitted a most interesting case, which looked like elephantiasis of the genitals. I saw a fairly healthy-looking man, with enormously swollen scrotum and perineum, without discoloration. There was history of some recent difficulty in micturition, but no retention and no pain. However, the history of the case showed that it must be one of extravasation. The scrotum and perineum were laid freely open, and, as far as I can remember, nearly three pints of very light straw-coloured fluid ran away into the dish which had been put under him. There was no difficulty in passing a full-sized catheter, and the patient made a good recovery.

In the last edition of the *Guy's Hospital Reports*, in a most interesting and practical paper on "Urethral Surgery," by Mr Golding Bird, I find that he mentions the case of an old man of 71, who walked about quite unconcernedly with extreme extravasation for a week, only applying for relief because *at last* he could not micturate, his tissues being as yet uninflamed, and presenting the appearance of simple though extreme œdema. He mentions another case in which a man ruptured his urethra, and for seven days went about with extensive urinous œdema, but without pain and without inflammation.

Mr Golding Bird does not suggest any explanation; he only mentions these cases as instances of the irregular way in which the tissues may behave when infiltrated with urine.

With regard to the cases of chronic extravasation, I have generally found them associated with neglected or overlooked

rupture of urethra; and I would suggest that the reason why this type is unattended with acute symptoms is that the subjects are generally healthy men engaged in healthy employment, their urine is healthy, and the leakage is slight; sufficient, indeed, to cause gradually extending local effects, but not, until some considerable time has elapsed, any septicæmic disturbance.

Cases of Chronic Extravasation due to Traumatic Stricture.

Denis Lynch, æt. 47, labourer, admitted October 6, 1890. Eighteen mouths previously was "struck in the testicles" by a piece of iron. For two months went on working, during which time the swelling was slowly increasing, and for a time he had to give up work. Four months ago he began to have great difficulty in passing urine, and the trouble had been increasing until he came to the hospital. On admission the perineum was found swollen and purple, the scrotum tense, red, and œdematous. He could pass a little urine. The usual incisions were made, the stricture was divided, and the bladder was drained through the perineum. Ten days later a full-sized catheter was passed through the penis and tied into the bladder, and drainage continued. The patient was much exhausted by long suffering and cystitis, and his convalescence was tedious, but he left the hospital cured and in good health on January 23, 1891.

Henry M'Manus, æt. 39, marine fireman, admitted November 12, 1891. Patient had had some difficulty in passing water (apparently following gonorrhœa) for four years; but it never prevented him from urinating naturally until about a month ago, when, on board ship, he accidentally sat down on a wooden tobacco pipe. About eighteen hours after, he had a pain in the perineum, and felt a lump there, which soon extended from scrotum to anus. He had to knock off work and keep in his bunk. He had no treatment, and had a very bad time of it, suffering great pain, and having great difficulty in passing urine. Apparently all that was done was poulticing, and after many days the swelling burst, and pus, blood, and urine came away in abundance, also masses of what probably was sloughing cellular tissue.

Most of his urine was being passed through two large holes in his perineum.

This case was one of the most difficult I ever had to deal with. The result of the burrowing of urine, &c., about his perineum and prostatic regions had been such that it was a considerable time before I could find the way into his bladder, after freely laying open his perineum; and there was a considerable stricture to divide in the anterior perineal or scrotal region. A full-sized catheter was passed through the penis into the bladder, and this treatment was continued for a fortnight. He went out well on December 25, 1891.

Thomas Meakin, æt. 28, was admitted under my care on December 28 for severe laceration of the left elbow, due to a machinery accident. Next day a strong urinous odour about his bed led to the discovery that he was suffering from old traumatic stricture, and perineal fistulæ; but I shall give a short account of this case at the conclusion of this paper.

AND NOW WITH REGARD TO TREATMENT.

In the acute gangrenous type, of course, the first thing must be free and deep incisions to let out the destructive fluids effused into the tissues; the median incision must, of course, be carried down deeply until the primary source of the mischief, the remains of the urethral abscess, is reached; and then the urethra behind must be sought for, and the bladder drained by a full-sized catheter, or, better still, by a rigid drainage-tube passed into it.

In these cases perineal drainage is better than drainage through the penis. The stricture has generally by this time been partly melted down or absorbed by the course of the disease, and a catheter can be passed through the penis into the perineal wound. Thus the urethra can be well cleaned, and also, if necessary, dilated day by day; and in the course of a few days it will be easy, and quite soon enough, to pass a full-sized catheter through the penis, and so round into the bladder. But there may be difficulty in finding a way, in the first place, into the bladder. In more than one case I have been foiled in so doing, and have not thought it prudent to persist in my attempt.

In some of these cases the region *behind* the triangular liga-
ment has been so invaded by the extravasated fluids, that a
catheter may be pushed without much force in almost any direc-
tion, and I can imagine with even fatal effect. I have never
forgotten seeing a post-mortem examination of a case where a
distinguished surgeon had passed a Holt's dilator through a false
passage in the neighbourhood of the prostate gland into the
peritoneal cavity, and dilated *that* opening; and I remember
one of my cases of extravasation which made a good recovery,
but, for two or three weeks after the operation, was in a very
unsatisfactory condition, with symptoms of pelvic cellulitis, until
an abscess in the left iliac or pelvic region burst into his bladder.

In such cases discretion is, I think, better than persistence.
Of course, it is more difficult to keep the patient clean and com-
fortable, but in the course of a day or two the way to the bladder
will easily be found without danger. The main points are to
relieve tension, to provide for the rapid clearing away of sloughs
and other poisonous matters, and for the escape of urine as
quickly as possible from the bladder. The division of the stric-
ture is a matter of secondary importance, and I think that very
often time is wasted over it; and, perhaps, even harm is done by
the prolongation of the time during which the patient is kept
under an anæsthetic.

In cases of chronic extravasation there can be no doubt that
the division, and the very thorough division of the stricture is
the essential part of the operation. My remarks as to the non-
necessity for immediate division of the stricture only refer to
the acute cases. In the cases of chronic extravasation, I consider
also that a full-sized catheter should be passed through the
whole length of the penis, and tied in for the purposes of drain-
age, for a few days.

And now with regard to the class which I have spoken of as
sub-acute or masked cases, I think I need say little more. The
cases which I have mentioned all point to the necessity for care-
ful examination and watchfulness; and of operation as soon as
there is reason to believe that the slightest extravasation has
taken place. As has already been pointed out, these cases may

easily be overlooked, and the first intimation may be given when the mischief has become general, instead of being confined to a small locality. In these cases I think it is most desirable to divide the stricture at the same time as the perineum is laid freely open, and for a few days drainage of the bladder by means of a catheter passed through the whole length of the urethra may be found advisable; but is by no means an essential.

While on this subject, I hope that experienced surgeons will pardon me for pointing out, for the assistance of our younger members, that a barely perceptible or doubtful fulness of the perineum will generally be made unmistakable if the patient is put into the lithotomy position, and the perineum thus put on the stretch.

As regards the treatment of ruptured urethra from injury, I need hardly say that the first thing is, if possible, to pass a catheter before any attempt at urination is made by the patient. Then the catheter should be tied in, and continued syphou drainage carried on for some days, *i.e.*, if a perineal opening is to be avoided.

But, with very few exceptions, my experience is that in a varying time, from a day to three or four days, perineal section is required, or, at all events, is advisable. Often it is called for on account of slight leakage of urine, and resulting decomposition and febrile disturbance; sometimes on account of increasing swelling, through extravasation of blood. For whatever reason the operation may be performed, I believe perineal section is really in the end a benefit to the patient; that it tends to more rapid recovery, and that it diminishes the risk of subsequent trouble, by lessening the tendency to traumatic stricture. But whether or not the perineum is opened, I believe in keeping a catheter tied into the bladder, through the penis (not through the perineum), for several days, as a splint, so to speak, for the torn urethra.

Some advocate the suturing of the torn urethra. I have never tried this, and am not disposed to do so. It must be a difficult and tedious business, and I doubt whether it can be of much benefit; and knowing how much nature will do, if only

she has the chance given, I doubt if this extra trouble on our part is " worth the candle."

All I can say is, that I have never had any cause to regret my treatment of any case of ruptured urethra; and I am sufficiently conservative to be satisfied with well-tried and satisfactory methods, rather than to experiment with new and doubtful measures.

A few words regarding the results of non-treatment shall bring my remarks to a close.

Last December I had the opportunity of seeing and treating a splendid example of surgical non-intervention. The patient, a man aged 28, was admitted for severe injury of one of his arms in cog-wheels. The next day a strong urinous odour about his bed drew attention to his urinary organs, and it was found that most of his urine ran away through two or three holes in his perineum.

We then learned that ten years before, in getting over the back of a chair, he slipped, and so injured himself in the fork that he bled freely. No instrument was passed, but his mother was instructed to poultice his perineum continuously. After a time the swelling burst, and for a long time all his water came that way. For the last ten years he has sometimes passed his water one way, sometimes another.

The case was a difficult one to treat; but after two operations, and a long course of catheterism, we were enabled to send the patient out in a condition of comfort to which he had been a stranger for more than ten years, i.e., with his perineum soundly healed, and the capability of passing a full stream of urine.

In this case, as in all cases of ruptured urethra, I have impressed upon the patient the necessity of coming to see me from time to time, so that any attempt at recontraction of the stricture may be counteracted.

Mr PAUL said that the time at the disposal of the meeting had so far waned that he felt himself only at liberty to touch upon one or two of the interesting points raised by the discussion. First, as to the immediate cause of the extravasa-

tion of urine.   He quite agreed with Messrs Puzey, Banks, and
other speakers, that what they called the text-book explanation
was only occasionally true; at the same time he believed
reference to the more modern text-books would show that their
teaching was hardly as bald as that described.   The view he
held and had taught for years was that the determining point
between urinary abscess and urinary extravasation was the
way in which the tissues responded to a local inflammatory
stimulus; in other words, to the amount of plastic exudation in
the surrounding cellular tissue excited by the primary peri-
urethral inflammation.   In the vigorous this plastic exudation
was extensive and resistant, and closed the cellular tissue
spaces, rendering them impervious to urine.   In such cases
a perineal abscess resulted, which, when opened, showed by its
fœtor, and by the subsequent escape of urine through the
wound, its connection with the urinary tract; a connection
which would have given rise to extravasation if something had
not occurred to prevent it.   In the old and debilitated, on the
other hand, deficient reaction and the absence of this plastic
and resistant inflammatory exudation permitted the urine a
ready access to the lymphatic spaces of the cellular tissue, as
was, of course, always the case in a recent rupture of the urethra,
or when it more passively, but equally suddenly, gave way
owing to some part of its wall being weakened by disease.   He
felt sure that when periurethral inflammation occurred
extravasation was always imminent; but that it was usually
averted by the intensity of the surrounding inflammatory
processes.

As regards the character and amount of inflammation set up
by extravasated urine, he thought the explanation given by
Mr Rushton Parker was the only one advanced in the least
degree tenable in the light of modern pathology.

Regarding treatment, there could be no difference of opinion
as to the propriety of incisions when extravasation had taken
place; but he could not agree with some speakers either as to
the urgency of immediate incision in all cases of impending
urinary abscess, nor as to the extent of the operation they

advised. He had known quite as much harm come from too early and too extensive incisions into the perineum as from too much delay. Every surgeon had his own data on which to decide when a few drops of pus had formed in the perineum, and it was quite time enough to cut into the part when this had occurred, provided, of course, that there was a passage for the urine, which was more often than not the case. When the abscess had been opened, as a rule, sufficient had been done for the present need, since it almost invariably communicated with the urethra, and, of course, on the bladder side of the stricture. He was a great advocate for washing out the bladder; but when in cases of urinary abscess this could only be done at the time of opening the abscess by proceeding to do a Cock's operation he thought it better omitted. Free exit for the pus and free exit for the urine were a *sine qua non;* but these were generally obtained by a simple perineal incision, and in the course of a few days it would be quite possible to wash out the bladder per urethram.

In traumatic rupture of the urethra he adopted the same general line of treatment. When an instrument could be readily passed into the bladder no incision was necessary. When it could not, an incision in the perineum on to the end of an instrument passed down to the rupture was all that was urgently required, since such an opening also communicated with the bladder end of the urethra, and allowed the urine to escape. At the same time it was desirable, if feasible, to pass a gum-elastic catheter down the penis, and on into the bladder, and to draw together the deep parts with buried sutures in such a manner as to approximate the ends of the urethra.

Mr RUSHTON PARKER said he considered that too much importance was often attached to the urine as an element in extravasation, and that an unnecessary amount of mystery was attached to the differences between the acute, virulent extravasation, and those that were obviously mild and chronic.

He considered the difference to be pretty much the same

as that between acute and chronic abscess elsewhere, the acute being due to the presence, products, and effects of micro-organisms, which in the chronic are absent.

As to causation, he considered extravasation of urine and urethral abscess to be one and the same thing, only in different degrees, and in different parts, of the urethral tract. In both conditions a catarrhal or otherwise inflamed state of the urethra is followed by a perforation and leakage, resulting in a varying degree of extra-urethral infiltration, suppuration, or even sloughing, varying in extent and virulence according to the number and character of the micro-organisms present. It is not the extravasation of sweet urine that causes spreading cellulitis and sloughing, but that of ammoniacal or otherwise decomposed urine.

What is the cause of the ammoniacal state of urine? Surely it is the invasion of micro-organisms, the fermentation set up by them, and the chemical irritants that result from the change. The true pathology of the state is thus explained, and the sloughing caused closely resembles that resulting from extravasation of fæces. He, therefore, could not accept the explanation offered by Mr Puzey, that in the cases of mild or chronic extravasation the urine so infiltrated owed its non-irritating properties to a diminished quantity of urea.

It was simply and solely a question of septicity or asepticity, and the explanation must be sought in first principles. There were certain cases of extravasation where sloughing apparently commenced at the skin (as sometimes may occur in great œdema), but not in the deeper parts in contact with the infiltrated urine which was found sweet and undecomposed, and the bladder free from cystitis. He had not read any references to such, but was reminded of a case where the stench was horrible, but where the patient was comparatively well. The extravasation caused great œdema of the scrotum, which was so distended that the skin lost its vitality, and being superficial and not protected against the micro-organisms of the adjacent dust and dirt, underwent decomposition, in fact, became gangrenous, over an area the size of the palm of a hand. The

subcutaneous tissue beneath was gangrenous over the same extent as the skin, but less and less so in the deeper parts, as found on cutting into the affected tissues. Mr Parker was here able to practise an ideal treatment that he had previously thought of, cutting away all the gangrenous tissues with scissors, and thoroughly washing with hot antiseptic solutions all the time. On reaching the urethra a cone-shaped gap had been made, with its base outwards. The urethra was next laid open freely, and the patient made a good recovery. He considered it important to drain the bladder by a tube after performing perineal section or external urethrotomy, but much more so where there was atony of the bladder than where there was not.

Mr BANKS, Mr G. GIBSON HAMILTON, Dr CAMPBELL, Dr CARTER, and some others, also took part in the discussion, but have not furnished abstracts of their remarks.

A SPECIAL METHOD OF APPLYING THE THERMO-CAUTERY IN THE TREATMENT OF CERTAIN CASES OF LUPUS VULGARIS. By G. G. Stopford Taylor, M.D., *Hon. Physician to the Liverpool Cancer and Skin Hospital.*[1]

GENTLEMEN,—I am desirous this evening of drawing your attention to a special mode of applying the thermo-cautery in treating certain cases of lupus vulgaris.

For years past reports have occasionally found their way into the English medical journals, but no details have been given as to how or when this valuable instrument should be employed.

It was during the latter half of 1891 that I began its systematic use. My first case was that of Alice B——, æt. 28, who had lupus of six years' standing, which originated in a wound in the lobule of the right ear. The disease involved the right ear, the whole of the right cheek, extending to within an inch of the outer canthus and the nasal and oral orifices ; the integument over the mastoid process and the scalp for an inch above it; while inferiorly it swept under the jaw from a point 3 inches below the situation of the lobule of the ear to the larynx. The helix and lobule were completely destroyed. Before she came under my care she had undergone treatment at the hands of some well-known and capable surgeons, who for the most part had resorted to the use of the solid stick of caustic potash and scraping, but without arresting the disease. The hypertrophic scar remains as a token of the destructive effects of the potassa fusa. By her own desire she was inoculated with Koch's tuberculin during the months of August and September 1891. This treatment had no influence on the lupoid nodules beyond causing a little desquamation. Considerable melting down, however, and subsequent improvement took place in the scar tissue, but the tuberculin had undoubtedly the effect of

causing a rapid increase in the size of the patch; the spreading of the margin, and the development of nodules at the periphery next the middle line of the face were most noticeable.

In October, when the patient came into hospital to undergo treatment with the cautery, she confided to the nurse that she had a sore on her head, which had been caused by an iron pan weighing 8 lbs. falling upon her during the time she was at home undergoing the inoculations. On examination, a lupoid patch was found situated to the left of the anterior fontanelle. It measured $1\frac{1}{2}$ inches by 1 inch in diameter. This was duly and freely excised down to the periosteum of the skull, and the margins of the wound were touched lightly with the thermo-cautery knife. The original disease on the face was firmly rubbed with a piece of lint soaked in a solution of liq. potass., 1 in 3, in order to remove any adherent crusts or scales, and also to thoroughly expose the superficial extent of the disease. I also went over the whole surface very carefully with the spoon, and when the bleeding had nearly ceased I took the needle-cautery and made a succession of punctures $\frac{1}{4}$ of an inch deep, so close together as to form a continuous line round the edge of the advancing margin; and lest this should prove ineffectual in arresting the disease I made a second series of punctures in the healthy skin in a similar manner outside the first at a distance of about $\frac{1}{4}$ of an inch, then with the button-cautery at nearly a white heat I firmly and slowly stroked the whole of the patch again and again until a hard, brown, leathery-looking eschar resulted. A carbolised oil dressing was applied twice daily until the sloughs separated, and in four or five days a clean and healthy but freely suppurating wound was left.

The second case is that of Alice Soresby, a child of 13, who came under my treatment from Mrs Birt's Sheltering Home for Waifs and Strays in January 1892.

The disease occupied the whole of the left cheek, covering much the same extent of surface as in case 1.

No reliable data could be obtained as to its cause or duration. You will observe from the water-colour drawing, by Mr P. Nairn of our city, that this lupus is very vascular and thick. For these

, reasons I determined to treat the disease as I would a naevus, by multiple puncturings $\frac{1}{8}$ of an inch deep with the cautery needle. These were continued until the whole patch assumed a reddish-grey appearance. The margin also was surrounded by a cordon of punctures. Free sloughing resulted. When the surface had healed I subjected the lupus to multiple linear scarification on two separate occasions.

After all this radical treatment, many lupoid nodules are still visible in Case 1, but they are gradually disappearing under the influence of a weak mercurial paste, which is rubbed in twice daily, and the patch is becoming paler. The patient is perfectly satisfied with the result, and declines further operative interference at present.

In Case 2, a considerable amount of lupoid tissue was seen in a discoloured cicatrix when the child left hospital in November 1892; but here is the interesting fact that all the lupus, except a few nodules, has since disappeared without any treatment at all, and the cicatrix has become perfectly white and presents no hypertrophy. What I am desirous of drawing your attention to particularly in both cases is, that no nodules have appeared outside the ring of punctures, though a few have appeared on the forehead at a little distance from the excised patch in Case 1.

During the past two years I have operated on about twenty cases in all with the thermo-cautery. Some have been treated with the button, others with the knife, and others again with the cautery needle; some again with a combination of all three.

While fully recognising and appreciating the many and varied modes of treatment of this very troublesome affection, we may divide them into two classes: the first, which aims at the removal and destruction of the morbid process by scraping, and subsequent cauterisation by chemical agents; and secondly, by the thermo-cautery alone, or in conjunction with other measures. I claim for the thermo-cautery that it not only destroys the disease, but, by bracing up and reducing the vascularity of the part affected, causes any remaining morbid tissue to disappear.

Those of us who have had much to do with lupus know that the rapidity of its growth is entirely dependent upon the temperature and the situation of the part attacked. For instance, lupus of the inferior extremities is very slow, and frequently undergoes spontaneous cure, while lupus of the face, more particularly of the middle line, travels very quickly, and is most rebellious to treatment. Now, I maintain that by reducing the vascularity of the tissues, and, consequently, lowering the temperature, we are enabled with the cautery to assist nature in throwing off the disease.

The plan I usually adopt (subject to such modifications begotten from experience) is to wash the diseased area with a solution of potash, varying the strength according to the thickness of the horny layer we wish to remove, then it is carefully and thoroughly scraped. Should there be much hæmorrhage, it is better to postpone the use of the cautery until the next day. Whether I use the cautery button or needle depends entirely upon the depth and vascularity of the disease. At one time I used the cautery knife to isolate the lupus patch from its surroundings, but I now find that the needle punctures answer better. You will observe that I use the button cautery as hot as I can get it, so that it chars the superficial tissues immediately it comes in contact, and thus prevents too great a destruction of the subjacent tissues, while sufficient heat is permitted to pass through and partly obliterate the papillary plexus. In this way I have often been surprised at the extreme thinness of the eschar, and the rapidity with which it separates. When the slough separates, and the wound is healed, the cicatrix is a pale pink in colour, but ultimately becomes quite white. Should any nodules appear in the scar they are immediately bored out. It is obvious then that surface cauterisation will fail in all cases of lupus infiltrating the subcutaneous tissue : for these I reserve the multiple puncturing with the cautery needle as in Case 2, for with it we are enabled to pierce the deeper horizontal vessels, and thus seal the channels by which the infective process is nourished, and its products carried to the adjacent, and it may be far distant, parts. Necessarily the

destruction of tissue is much greater than in the former method, and the slough is longer in separating—a week or ten days—the wound much longer in granulating, but the ultimate result is superior. In all constitutional affections our treatment must necessarily be slow; and although we cannot show the immediate and brilliant results of general operative surgery, still we claim that with the thermo-cautery we have an instrument with which we can contend successfully with cutaneous tuberculosis.

THE ÆTIOLOGY OF LICHEN URTICATUS.[1] By Frank
H. Barendt, M.D. (Lond.), F.R.C.S. (Eng.), *Pathologist
Royal Southern Hospital, Honorary Surgeon to St
George's Hospital for Diseases of the Skin.*

The few remarks I have to make upon the ætiology of lichen
urticatus are intended to accentuate certain points which I
believe have hitherto been regarded as of little moment by the
majority of medical men.

My experience is based on several cases that came under my
observation during the past summer at St George's Hospital for
Diseases of the Skin, and also in private practice.

The name lichen urticatus owes its origin to Bateman, who
described the eruption as consisting of small red papules about
as large as a pin's head, generally preceded by wheals of similar
size. It is practically only met with in children, and is accom-
panied by intense itching—a point which I wish to lay particular
stress upon.

The itching is nearly always at night when the skin is warm,
and it is during this period fresh crops of efflorescences make
their appearance. The broken sleep caused by incessant
scratching on the part of the little patient interferes with the
health, and as a result he is frequently languid and peevish
during the day. This languor is often interpreted by the
medical attendant, and as a rule by the mother, as corroborating
the view that the rash is the visible expression of *some* internal
constitutional disturbance—generally the alimentary canal.

The disease has also been termed prurigo infantilis; but as
the word "prurigo" has been used by Hebra, senior, to connote
an altogether different affection first described by him, and often
called, therefore, "Hebra's prurigo," it is better to discard its
use as a synonym for lichen urticatus.

Some authors call it "urticaria papulosa," to which no objec-

tion need be taken, unless it be the one, that as the papules (the form elements of lichen) are more conspicuous and persistent than the transient wheals (the form elements of urticaria), it is preferable to view the disease clinically as a lichen and not as a form of urticaria. However, this is but a question of terminology, and I have no desire to enter into a discussion which at best has but an academic interest. So much for nomenclature.

There is no necessity for me to describe the macro- and microscopical appearances of the rash; these are sufficiently set forth in the various treatises on skin, and there is nothing new to add to them. But I may remark, in passing, that the longer the patient's nails were—which was usually the case—the greater were the number of papules tipped with scabs. Among all the cases the presence of flea-bites could be easily determined, and these were thickest in the vicinity of the rash. In none was I able to detect any typical wheals; the mothers, however, stated that " hives " were present in the morning. As I first saw the patients in the afternoon, no doubt the wheals had subsided, or been replaced by papules. In one case staphylococci had been inoculated, and the skin was then decked out with pustules; such a rash would receive the name of ecthyma by older writers.

The distribution of the rash is, in my opinion, most characteristic, and of distinct ætiological value. It is confined to the root of the neck, chiefly its anterior aspect, mammary and deltoid regions, arms and forearms, hypogastrium and buttocks, anterior and external aspects of the thighs. In short, its distribution was commensurate with the skin areæ over which the little patient could wield his finger-nails most readily, and in the majority of cases most effectually. Where the region was difficult to reach—*e.g.*, the back of the neck and interscapular region, from the involved muscular movement, and owing to distance, *e.g.*, the legs proper; or where the skin was covered by the undergarment in which they sleep, viz., the middle third of the trunk—*the rash was absent.*

We may therefore conclude that lichen urticatus is the pro-

duct of the patient's nails, and its distribution is dependent
upon the accessibility of the above regions to these.

Now, in the production of skin-affections, it is customary to
search for the exciting cause and the predisposing cause. I
think we have both of these at hand. The exciting causes are
fleas and bugs, for although their presence was reluctantly
admitted by the mothers, the skin in all my cases revealed
numerous old and recent flea-bites. But if this is so, the
question arises, Why is not lichen urticatus far more frequent
than it is? The answer is to be found in the predisposing
conditions. Lichen urticatus appears with the advent, and
disappears with the termination of the warm season; further-
more, the irritability of the normal skin is always greater in
summer than in winter, and pruritus—pathological itching
—is always worse in hot weather. As a result, a pruriginous
state of the skin becomes developed—in short, the more the
skin is scratched the more irritable it becomes, and once this
condition is established, the presence of fleas and bugs keep it
active. Jonathan Hutchinson has drawn attention to this
pruriginous state of the skin, and the great importance these
pests have in producing it.

Again, any modification of the nutrition of the skin, whereby
its irritability is increased, is a predisposing factor. The exan-
themata act in this way. Two of my cases had just recovered
from varicella, two from vaccinia, and one from scarlatina. A
nervous, excitable disposition is also a favouring condition.

The practical point in this view of the ætiology of lichen
urticatus is to insist on the thoroughness of local treatment.
The pests may be got rid of by using insecticide powder, dusting
it not only between the sheets and blankets but also over the
child's body. The patient's nails must be pared and prevented
from ravaging the skin at night by a suitable night-dress. This
should be fairly long, closed by a running stitch at the bottom,
and made to fasten behind. The sleeves should be long enough
to enclose the hands, and should be sown up at the end. By
means of a shoulder ribbon passing round the axilla, the arm is
effectually prevented from wriggling out of the sleeve. The

whole of the integument—save the face and scalp—should be
thoroughly anointed at night-time with a mild antiseptic
ointment, *e.g.*, acidi carbolici, 1 per cent., or β-naphthol, 2 per
cent., in benzoated lard.   A warm bath may be given the
following morning, and should there be any redness of the skin,
or even as a matter of precaution, a dusting powder consisting
of equal parts of finely powdered oxide of zinc, Venetian talc,
and rice starch may be lavishly dredged over the surface.   This
method soon cures the affection, if properly carried out.   Fortu-
nately, an examination of the skin for flea-bites will help us
materially to decide this point.   Hence, as routine practice,
there is no necessity to treat the digestive tract as the *fons et*
origo mali, or administer so-called alteratives.   Of course, if
the child is weak, hæmatinics and nutritious diet must be given.
Sedatives in the shape of bromides or chloral to assist sleep, I
have never thought of prescribing.

I hesitated at first to bring before your notice such *banal*
remarks, but I have been prompted to do so because I believe
lichen urticatus to be a local disease brought into existence
under favourable conditions, and not a disease caused by certain
states of the alimentary canal of which nothing definite is
known, and which I venture to suggest does not exist.

SUCCESSFUL OPERATION FOR MALPOSITION OF THE TESTES, AND DOUBLE CONGENITAL HERNIA. By DAMER HARRISSON, F.R.C.S.E.

THE patient, S. P., upon whom this operation was performed, was a tall well-developed man of 21 years of age. Being anxious to enlist in the army, and having been told that he might be admitted if the congenital deformity was put right, he came to the Northern Hospital to inquire if anything could be done. Upon examination I found that neither testis had descended to its natural position, but was situated on both sides immediately over the external abdominal ring, and to some slight extent resting upon the external column. There was a well-marked hernia on both sides, occupying the inguinal canal, and presenting at the external opening after the patient had stood for some time. Both testes were fairly well developed, although smaller than normal. There was no scrotum, but in the perineum, in the median line immediately behind the penis, the skin over a small area was freely movable upon the tissues beneath, and a little puckered.

On 10th June 1892 an incision 2 inches long was made on the right side; by careful dissection a small omental hernia and the testicle was exposed, the sac of the hernia was then dissected from the cord and divided, the lower portion of the sac being closed with catgut sutures to form a tunica vaginalis; the upper portion of the sac being ligatured at the internal abdominal ring.

All the cremasteric and connective-tissue attachments were dissected from the testicle and cord, and this had to be done so thoroughly that only cleanly-dissected vessels and vas deferens remained. It then became possible to pull the cord from the abdominal cavity until it was sufficiently long to allow the testicle to descend to a natural position. The incision was then extended downwards into the perineum, and a flap of skin dissected from the tissues beneath on the right side, all subcu-

taneous fat and connective tissue being excised down to the
deep fascia. The testicle was then covered by the skin flap,

Fig. 1.

and the whole length of the incision sutured, a horse hair drain
extending from the upper extremity of the incision to the lower

for 24 hours. The testicle at first appeared to have too little room, and to be too much pressed upon; the tension, however,

Fig. 2.

quite disappeared in a few days, and the patient made an uninterrupted recovery. Fig. 1 represents the condition after the first

operation, the skin covering the testicle having gradually adapted itself to the new condition, and the left testicle being still in its abnormal position, represents exactly the appearance of the testicle on the right side before operation. On July 20th, $5\frac{1}{2}$ weeks from the date of the first operation, an operation was performed upon the left side, similar to that which had been performed upon the right. The same difficulties were met with, the dissection of the whole of the connective tissue from the vessels and vas deferens having to be made before the slack in the abdominal cavity could be pulled out—this, in each case, measuring not less than 2 to $2\frac{1}{2}$ inches. The patient for a time complained of want of sensation in both testes, and over the area of distribution of the genital branch of the genital-crural nerve.

Sensation quite returned to both testes in a few weeks, and they were freely movable in their new coverings.

Fig. 2 represents the condition when the patient was about to leave the hospital.

A scar can be seen both on the left and right side in the inguinal region representing the upper end of the incisions made at the time of operation. The patient, when last seen, was sexually quite normal, and the testes had become larger and quite normal in size.

From the very marked development of the testes when relieved from pressure, and placed in their normal position, it appears to the writer that surgeons should hesitate in removing even an undersized organ when operating under similar circumstances for congenital hernia, providing they are so fortunate as to find sufficient length in the cord for the malposition to be remedied.

So far as the writer has been able to ascertain, this is the only case recorded in which a similar malposition of the testes on both sides has been rectified.

NOTES ON TUBERCLE AND TUBERCULOSIS OF HUMAN SKIN. Leslie Roberts, M.D., *Dermatologist to the Royal Infirmary, Liverpool.*

Summary.—The Microphyte—Channels of Infection—Construction of Tubercle—Channels of Secondary Infection—Chemistry of Tubercle—Retrogressive Changes—Clinical Forms—What is Lupus?—Lupus of Mucous Membranes.

The chapter on the pathology of lupus has been entirely re-written during the last ten years. It opens in 1882, when Koch isolated the tubercle bacillus and established beyond doubt or cavil that it was the actual *materies morbi* of tuberculosis. Pathologists were doubtful at that time whether lupus should be included among the manifestations of tuberculosis, but Leloir's admirable experimental researches decided in 1883 that lupus is an attenuated form of tuberculosis. The pathology of lupus is therefore the pathology of tubercle; and the more we know about the natural history of tubercle bacilli the more likely we are to wage successful war against this scourge of mankind.

THE MICROPHYTE.

The tubercle bacilli are minute vegetable micro-organisms, whose growth is chiefly in one direction, producing a rod-shaped form 1.5–3.5μ in length. They are frequently slightly bent or curved. Spores are formed endogenously within the mother-cell, varying in number from 2 to 6, with very slight affinity for aniline dyes, and possessing a higher index of refraction than cocci. The bacilli have no independent power of movement; they obtain locomotion through the white blood-cells, between which and the bacilli exists a marvellous chemical affinity (chemotaxis). There seems to exist a peculiar antagonism between the nuclei of the white corpuscles and the bacilli. Both cannot exist within a certain distance of each other, and their presence together within a cell results in the death of one or the other.

CHANNELS OF INFECTION.

There are four channels by which the tubercle bacilli may enter the human body :—

1. Through the maternal parent—infection by inheritance.
2. Through the food—enteric infection.
3. Through the air we breathe—atmospheric or pulmonary infection.
4. Directly through the skin—cutaneous infection.

It is only during the last ten years that these channels have been mapped out; and we have gained an enormous advantage over our adversary in being able to locate them. If the recent experiments of Londe are confirmed, then we are provided with experimental proof that tubercle bacilli are able to pass in the blood-stream from the mother to the fœtus. He found that 2 c.c. of blood taken immediately after birth from the umbilical vein of a still-born, the offspring of a woman in the condition of rather advanced phthisis, produced tuberculosis when injected into the peritoneal cavity of a guinea-pig. Tubercle bacilli were demonstrated in the blood of the portal vein of a fœtus born of a phthisical mother. When these facts are put in the light of clinical experience, there can be little doubt that many forms of "cryptogenetic" tuberculosis, manifesting themselves between the third and twelfth month of infantile life, are maternal in origin. Now, I am unaware of a single case of lupus which has appeared during this period of life. In consequence of this, the difficulty of proving that lupus may be derived through the maternal parent by inheritance is greatly increased, since after the first year of life the possibilities of infection through other channels are vastly greater. Still, it is conceivable that tubercle bacilli may be derived from the mother, conveyed in the blood-stream to the derma, and there remain dormant until circumstances favour its development. This view is maintained by Baumgarten. We can say, on the strength of a large amount of evidence, that lupus is rarely derived in this way.

In 1884 Baumgarten confirmed experimentally the conclusion

of the French veterinarians, that the *materies morbi* of tuberculosis could be conveyed by food. Baumgarten fed a rabbit on 2 ounces of milk containing a pure culture of tubercle bacilli ; after fourteen days' latency the lymphatic follicles of the mucous membrane and mesenteric glands began to enlarge simultaneously without any change whatever in the intestinal epithelium.[1]   This experimental evidence is amply confirmed by the clinical experiences of physicians attached to children's hospitals.   The frequency of primary enteric tubercular infection in weaned infants can only be accounted for by the hypothesis of infection by food.   Bang of Copenhagen,[1] Galtier, and Henn have shown that milk, butter, cream, cheese, butter-milk may contain tubercle bacilli, and that these may retain vitality in such products from fourteen to thirty days.   Have these common articles of diet anything to do with the diffusion of lupus ?   In weaned infants, who are most susceptible to enteric infection, we do not meet with lupus, and lupus children are never, so far as I know, the victims of enteric tuberculosis.   Nevertheless, we are confronted with this undoubted fact that the pathogenic microphytes of tuberculosis may enter the human body by the intestinal lacteals ; and there is no certainty, when once within the interior, that they may not ultimately reach the blood-stream.   The whole question of enteric origin of lupus is, in the present state of our knowledge, purely speculative, and can have no practical claim upon our attention until fresh evidence is forthcoming.   The evidence of pulmonary origin of cutaneous tuberculosis rests upon equally speculative hypotheses.   I do not know of a single case where phthisis has preceded lupus,[2] although there is a great deal of evidence to show that phthisis may follow lupus.   By this method of reasoning by exclusion we are driven to the conclusion that lupus, and probably most forms of cutaneous tuberculosis, are local in origin, and that the tubercle bacilli enter directly from without.   Both clinical and experimental patho-

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[1] See address by Burdon Sanderson on tuberculosis in *B. M. J.*, August 1891, p. 403, where fuller reference is made to these researches.

[2] Phthisis may precede the so-called tubercular ulcer of the skin.

logy are in favour of this view. Eve's experiment whereby lupus was inoculated on the ear of a rabbit by direct contact with lupus matter is direct evidence of this. Three cases have been noted by Colcott Fox in which tuberculosis of skin in elderly people have followed burns; and one of these patients, it is expressly stated, was nursing a phthisical patient. Quite a considerable number of such cases are now on record. Pre-existing lesions of the skin may form the starting-point. Radcliffe, Crocker, and Kaposi have known the disease to begin in the vesicles of herpes. Jadassohn reports in *Virchow's Archives*, 1890, a case where lupus started in a wound inflicted accidentally on the finger of a butcher's boy. Badal of Bordeaux has seen lupus begin at the orifice of a fistula of the lachrymal sac. In this case the lesion was situated below the orifice of the fistula, and had started in the portion of skin constantly bathed in the pus. Dubreuilh has observed that when the pus of surgical tuberculosis, which is poor in tubercle bacilli, is inoculated on skin it produces a tuberculosis of torpid type similar to lupus. Lupus has been known to appear in tattooed parts when tubercular saliva had been used to mix with the pigment. Dubois-Havenith mentions a case, quoted by Malcolm Morris, of two sisters who shared the same bed, one of whom had for eight years had a large patch of lupus on the left cheek. For the last two years the other sister has had a lupus patch on the lobe of the right ear—that is to say, the ear which is sometimes in contact with her sister's cheek as they lie in bed.

On the ground of this evidence I think we are entitled to conclude that lupus may and is commonly produced by the direct penetration through the skin of the tubercle bacilli.

The face is the part most frequently attacked, and here the disease generally starts, although no part of the cutaneous tract is safe from invasion. Now, why should the face, and especially the nose, be more susceptible to invasion than any other part of the body? Probably on account of its exposure; its liability to minute fissures and cracks; the frequency with which it is brought in contact with the hands, those active agents in the transmission of disease; and fourthly, the large size of the

sebaceous follicles in this region, which offer greater facility to the entrance of micro-organisms than regions poorly provided with these glands.

How the bacillus passes through the epithelium is by no means clear, for the organism itself possesses no power of movement. Possibly the unconscious massage of these parts by the hands plays some part in mechanically pressing the microphytes into the deeper layer till laid hold of by some wandering leucocyte. In whatever way it passes through the epithelium, it does so without leaving any trace whatever of its presence. Epithelium is no soil for tubercle bacilli.

CONSTRUCTION OF TUBERCLE.

Having reached the connective tissue of the derma, the microphyte remains dormant for a longer or shorter time, according to the vulnerability of the soil. The latency of tuberculosis is an established fact in the pathology of tubercle. All the clinical ensemble of facts which constitutes what we term *scrofula*, when translated into the language of pathology, means vulnerability of tissue soil to the attacks of tubercle bacilli (Malcolm Morris). Where these conditions exist the latency of tubercle is a relatively short one, and when absent it is a long one.

The initial phenomenon of their commencing aggressive action is *proliferation of the connective-tissue corpuscles.* The various steps in the construction of the tubercle have been ingeniously followed out by Pawlowsky, whose researches are recorded in the *Annales de l'Institut Pasteur*, February 1892. Pawlowsky induced tuberculosis of the joints of guinea-pigs by injecting into them pure cultivations of tubercle bacilli.

According to this observer, the construction of tubercle is as follows:—When the period of latency is over, the bacilli enter first into the connective-tissue corpuscles, which, if the number of bacilli is small, proliferate and are transformed into epithelioid cells, the plasma cells of Waldeyer. If the number of bacilli is great, the cells perish outright, and necrosis is the result. The white blood-corpuscles perish if attacked by many bacilli; but if by a few, they are metamorphosed into epithelioid cells, which

take part in the formation of the tubercle.   Thus the white
corpuscles, according to Pawlowsky, aid in the construction of the
tubercle, although they play only an accessory part in its forma-
tion.   Baumgarten does not agree with this, and denies that the
white corpuscles have any constructive function in the formation
of tubercle.   But Pawlowsky is quite certain on the point, and
affirms that he was able to observe all the intermediate stages
between the white corpuscle and the large epithelioid cell.   The
result of this cell proliferation is the formation of a spheroid
mass of cells, presenting a graduation of forms between the con-
nective-tissue cell and white blood-corpuscle on the one hand,
and the large epithelioid or plasma cell of Waldeyer on the
other.   Pawlowsky's researches do not clear up the mystery of
the giant cell; we are still left to choose between the hypotheses
of Weigert and Unna.   The continuous growth and proliferation
of cells in the tubercle have the effect of stifling the blood-vessels
which permeate the mass, and lead in this way to certain
consequences.   But the white corpuscles have other important
functions to perform.   As soon as the bacilli become active and
aggressive, a struggle for existence is at once started between
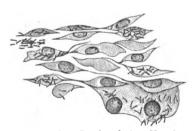
FIG. 1—(after Pawlowsky).   Showing
connective-tissue corpuscles invaded
by tubercle bacilli.
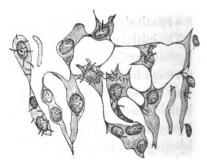
FIG. 2—(after Pawlowsky).   A more
advanced stage than fig. 1.

the active cells and the microphytes.   The white corpuscles ad-
vance towards the connective-tissue cell, or cells, which contain
bacilli, press close to their outer walls, and throw out pseudo-
podia, which by some marvellous and yet unknown power attract
the bacilli to themselves.   This process is depicted in fig. 3.

When laden with bacilli they leave the infected cell, and move off with their perilous burden. A struggle begins between the bacilli and the nucleus of the white corpuscle. If the nucleus

FIG. 3—(after Pawlowsky). Leucocytes invaded by tubercle bacilli.

FIG. 4—(after Pawlowsky). Showing leucocytes surrounding the connective-tissue corpuscles for purpose of carrying off the bacilli.

is beaten, the cell disintegrates, and the bacilli are deposited to re-begin the construction of fresh tubercle; if it retains its vitality the bacilli may die, or the wandering bacilli-laden cell be checked in its course by some neighbouring lymphatic gland.

CHANNELS OF SECONDARY INFECTION.

The experiments of Leloir have shown that the infective matter of lupus travels by the lymphatics. He reports cases where glands in the neighbourhood of lupus have become secondarily affected by tubercle. And not only may tubercle pass from the skin to neighbouring glands by the lymph path-way, but tubercle has been observed by Radcliffe Crocker to pass from primarily affected glands to the skin, and there give rise to ordinary lupus.

It is doubtful whether the blood-stream is ever employed as a vehicle for the dissemination of tubercle of the skin. Miliary tuberculosis is supposed to arise from hæmic infection, and three cases of miliary tuberculosis of the skin are on record. Two are recorded by Phillippson of Hamburg: in each the lupus nodules appeared soon after an attack of scarlet fever, and in a few months had disseminated over the whole body without provoking

any irritative inflammatory effect. The third case is reported by Besnier. The lupus nodules appeared soon after recovery from measles, and spread rapidly over the whole body without provoking any irritation in the surrounding tissue.

CHEMISTRY OF TUBERCLE.

So far, we have only considered the progressive or formative side of the life of tubercle. We may now turn to the retrogressive aspect of its life. In order to understand this, we must consider briefly the chemistry of tubercle. Our knowledge of this is of quite recent origin, and constitutes the greatest benefit which we have derived from Robert Koch's discovery of tuberculin in 1890. It has been established by extensive clinical and pathological observation that the activity of tuberculin, *i.e.*, the products of tubercle bacilli, manifest themselves in three ways :—

1. Local inflammation.
2. Constitutional disturbances, principally fever.
3. Increased activity of tubercle bacilli.

It was shown that the behaviour of tuberculin derived from pure culture is essentially identical with natural tuberculin generated in the tubercle itself. This in itself was a great discovery, worthy of a great biologist. The subsequent researches of Crookshanks, Herroun, and Hunter have thrown much light on the nature of these bacillary products.

Dr Hunter's elaborate researches led him to conclude that the active ingredients of these products (tuberculin) are of the nature of albumoses, alkaloidal substances and extractives. Hunter's success in isolating the alkaloidal or non-albuminous products from the albumoses afford him and other observers the opportunity of demonstrating their different actions on the body. The alkaloids are pyrogenic and toxic ; the albumoses provoke *local* and, apparently in some instances, antagonistic actions, such as catarrhal inflammation and shrinkage, with desquamation. These products are derived from the plasma of the bacilli themselves, and not from the native tissue cells.

We can scarcely lay too much stress upon these researches of Hunter, seeing that they provide us with the clue to attain a right understanding of the nature of lupus and other forms of cutaneous tuberculosis.   Lupus is not a simple single process, but an aggregate of processes arising out of a primary one, viz., the formation of tubercle.   The tubercle tuberculinises, so to speak, the neighbouring cells. Chemical operations, not vegetative ones, cause the malignancy of tubercle.   As vegetations the tubercle bacilli are scarcely recognisable in the skin; and so potent are their products, that their injurious effects bear no proportion to the bulk of these vegetations.[1]

RETROGRESSIVE CHANGES.

We may consider these briefly under two heads:—

1. The degeneration of tubercle itself.
2. The influence of tubercle on the native cells of the invaded tissue.

In considering the intra-tubercular changes, we are led, to some extent, into the region of hypothesis.   But it is not my intention in writing this introductory article to enter into a discussion on the relative merits of Weigert's coagulation necrosis hypothesis, and Unna's cell-aggregation theory of the formation of giant cells.   We may take Virchow's old view of *internal pressure* to account for a good many of the phenomena of retrogression.   The tubercle may terminate in four ways:—
1. Absorption; 2. Cheesy metamorphosis; 3. Fatty metamorphosis; 4. Fibroid metamorphosis.

Cutaneous tubercle may be absorbed.   Spontaneous case of lupus is excessively rare, but has been recorded.   Cheesy metamorphosis is, I believe, rare, or never found in lupus.   The

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[1] As evidence of the clinical value of this knowledge of the chemistry of tubercle, consider the light thrown by Hunter's researches on Lespinne's observation of acute general infection occurring in the course of a case of lupus. The patient suddenly developed a rise of temperature, and fell into a condition of prostration resembling typhoid, accompanied by diarrhœa and catarrhal signs in the lungs. The temperature soon fell to normal, and the patient soon recovered health, without leaving any signs of internal disease. Unna's massage experiments on lupus are explicable in the same light.

fibroid metamorphosis is of most practical interest to us. The plasma or epithelioid cells are gradually changed into fibroid cells. This has been carefully described by Leloir. The same observer has shown by his inoculation experiments that the tubercle gradually loses its virulence, and if injected into guinea-pigs does not reproduce the disease; but, locally, it remains infective at the margins, and may throw off satellites. This fibroid variety of tubercle is the most benign of all the varieties, spreads most slowly, and is most amenable to treatment.

Regarded purely clinically tubercle is an irritant; a sort of persistent aggressive thorn in the flesh (Payne). These *irritative effects of tubercle* in the skin may be fairly divided into four categories:—1. Catarrhal; 2. Necrotic (atrophic); 3. Fibrinous; 4. Epitheliomatous.

1. *Catarrhal.*—Pure tubercle is not commonly met with in skin. The albuminous products of tubercle bacilli possess the power of inducing fluxion of blood and suppuration. Lupus is commonly tubercle plus local inflammation. The recognition of this is of much practical value, because the proper treatment of the local inflammation is different from the treatment which is successful against tubercle itself. This will be referred to specially in a future article on the treatment of lupus.

The relation of pus to tubercle is worthy of very careful study, and is not such a simple matter as it seems. The formation is either microbic or chemical in origin. The researches of Leloir on the association of staphylococcus with tubercle bacilli, demonstrated that the pus organism was not present in those cases of non-ulcerative lupus examined by him, but present always in the ulcerated varieties. M. Christmas has proved experimentally that pus organisms are not essential to the formation of pus; and the later researches of Hunter have given us reason to believe that some of the albuminous products of tubercle bacilli may provoke suppuration in the neighbouring tissues. The inflammatory excitement of a lupus patch is always attended by danger of re-infection, and in practice we should always endeavour to allay it as soon as possible.

2. *Atrophic and Necrotic.*—The mutilations of lupus are common clinical occurrences. The process of destruction is severe or slight according to the number of active tubercle bacilli and the degree of vulnerability of the tissues of their host. Practically this means that if a patient is scrofulous he will suffer more from his lupus than one who shows no obvious signs of scrofula. The destructive process extends in the superficial plane of the skin, not in a vertical direction ; it is extensive rather than deep. It may involve skin and cartilage, but never bone. Hence the diagnostic importance of lupus ulceration. Tubercle undermines the epidermis, which gives way in consequence. Loss of tissue is replaced by scar tissue. Atrophy may occur without ulceration.

3. The *fibrinous* result is well illustrated in the so-called lupus elephantiasis, a case of which, under the care of Mr Malcolm Morris, I reported some years ago. Under the influence of the tubercle, the dermis becomes enormously hypertrophied. It is conjectured that this hypertrophy is the result of lymphatic occlusion. Other fibrinous products of lupus are keloid, but this is probably due to treatment. I have seen it as a sequela to the puncture treatment.

4. *Epitheliomatous Effects.*—Although the epidermis is an unsuitable soil for tubercle bacilli, it may be affected secondarily. We have referred to the ulcerative changes, we have now to consider the formative changes. They are of two sorts—benign and malignant. The benign is seen in *tuberculosis verrucosa cutis* (Riehl and Paltauf), or the post-mortem wart, lupus hypertrophicus, and lupus papillomatosus. The epithelial cones are enlarged, but the physiological boundary between the papillary layer and epidermis is preserved. The *malignant variety* is certainly rare. Cases of lupus, complicated with epithelial cancer, have been recorded by Hebra, Kaposi, O. Weber, Wenck Thiersch, Volkmann, Laug, Esmarch, Hutchinson, Dubois-Havenith, and Radcliffe Crocker. Out of 118 cases of lupus under the care of Dubois-Havenith, 5 developed epithelial cancer. The new growth is a genuine epithelial cancer. It may arise out of scar tissue, or out of the epithelial cones, under the

influence of the tubercles. In the latter case it advances towards a fatal issue with terrible speed. When it arises out of scar tissue, it may be removed surgically with a more hopeful prospect of recovery.

CLINICAL FORMS.

There are many lesions of the skin produced by tubercle. An exact description of their clinical features would fill several pages; we must, therefore, content ourselves with touching upon the more important points. The common feature of the whole group is local infectiveness. They are all locally inoculable diseases, but, in this respect, have to be clinically distinguished from syphilis, leprosy, yaws, and glanders. It is by no means certain that, histologically, the distinction between these several diseases is a radical one, but clinically they are very different. The cutaneous diseases which are at present considered as tubercular manifestations are:— 1. Strumous ulcers; 2. " Lichen scrofulosus;" 3. Erythema induratum scrofulosorum; 4. Tubercular ulcers associated with internal tuberculosis; 5. Tubercular cutaneous lymphangitis; 6. Verruca necrogenica (post-mortem wart or tuberculosis verrucosa cutis of Riehl and Paltauf); 7. Lupus vulgaris. The first, second, and third of these diseases are associated with the condition called *Scrofula*, an inherited delicacy of the tissues, which makes them better soils than healthy tissues for the nourishment and maintenance of tubercle bacilli. The condition of such individuals is one of abnormal vulnerability to these and other microphytes (Malcolm Morris). If we are to admit that all these affections possess a common anatomical element, tubercle, we are very far from being able to explain the clinical differences of its manifestations. It is not unreasonable to suppose that variations may be met with in the species of tubercle bacilli, and if Klein is correct, we are already aware of two such varieties in bovine and human tubercle bacilli.

1. The *strumous ulcer* may be recognised by its association with other signs of scrofula, such as enlarged, caseating, suppurating glands, conjunctivitis, old keratitis, inflamed meibomian

glands, joint or bone disease, &c. It may take the form of a flabby pus-forming ulcer undermining its edges, or of a formative ulcer taking on a papillary hypertrophy (senile struma). It may arise out of a caseating gland, or out of a subcutaneous nodule, and occasionally from diseased bone (tubercular osteomyelitis).

2. *Lichen scrofulosus* is an entirely different affection from true lichen. It is not often met with in this country; nor, indeed, is it generally recognised by the profession. It is more prevalent in districts where tuberculosis is rife, as in Vienna. The lesion takes the form of pale red-tinted papules clustered in circles and crescents on the trunks of children with signs of scrofula, and not accompanied by much, if any, irritation. Jacobi has demon-strated bacilli, and Darier giant cells. The follicles are the seat of the lesions.

3. *Erythema induratum scrofulosorum*, originally distin-guished by Bazin as a distinct morbid entity among the erythemas, and recently fully described by Colcott Fox. The lesions consist of nodules seated in the subcutaneous tissue; in the early stage they can be felt before they are seen; blood fluxion in the superjacent skin gradually supervenes, and increases till the colour changes to a livid red. They are mul-tiple (generally) discrete, almost always exclusively on the legs, and by preference on the calves, free from pain and tenderness. The nodules break down, leaving deep punched-out rounded ulcers, closely resembling breaking-down syphilitic nodular gummata. The evidence of their tubercular nature is rather slender, and rests exclusively, at present, on clinical grounds. Enlarged suppurating glands and defective circulation have often been observed to coincide with the disease. The patients are generally strumous girls or young women.

4. *Tubercular ulcers*, associated with tuberculosis of other organs. Before lupus was understood to be tubercular, this lesion was described as primary tuberculosis of the skin, an expression which is misleading in the present state of our knowledge. It would be more correct to style lupus a primary tuberculosis of the skin, which it is in the true sense of the word. The particular lesion under consideration is a rare

manifestation of tubercle, and either shortly *precedes* internal tuberculosis (Köbner), or, as is most commonly the case, supervenes pulmonary or intestinal tuberculosis. The ulcers commonly form close to the junction of skin and mucous membrane (Radcliffe Crocker), spread slowly, without any tendency to heal, with irregular undermined edges, and moist, scab-covered surface, not malignant in their extension, the patient's life rapidly terminating from internal tuberculosis.

5. *Tubercular Cutaneous Lymphangitis.*—We possess a fair amount of evidence, both clinical and histological, that tubercle may attack the lymphatic trunks and networks of the skin. They do not form such congenial soil for the bacilli as the lymph-glands themselves, as is well proved by the comparative infrequency of this form of tuberculosis. It may be primary, as the result of direct inoculation of tubercular matter, or secondary to tubercular osteitis or cold (tubercular) abscess. According to Lejars, to whom we are largely indebted for our knowledge of this affection, the lymphangitis may take two principal forms— (1) linear, and (2) reticular. In the linear variety the infection travels from the local source (generally a tubercular wart) along the lymph trunks, producing intradermic or subcutaneous nodules at intervals. The nodules increase to the size of a nut, break down, ulcerate the superjacent skin, discharge pus (sometimes lymph); the tubercular mass is thrown off, and finally the gap fills up with cicatricial tissue, forming a thin scar, violaceous in colour and round in form. The neighbouring lymph-glands are not invariably affected. If the axillary glands become affected, infection of the lungs may supervene. Instead of a serial formation of nodules, a few nodules may arise at a considerable distance from the source of infection.

The scrofular gummata and cold abscesses are thought by Lejars to be forms of tubercular lymphangitis. The reticular variety assumes the form of a fine red network, occurring generally in the region of a fistular leading to tubercular bone.

6. *Verruca Necrogenica.*—This is the form produced by direct inoculation of tubercular matter. It occurs on the hands of butchers, coachmen, cooks, mortuary men, and those whose

duty is to perform autopsies. The disease is usually on the knuckles or interdigital folds. The inoculation is followed by the formation of a papule, which becomes pustular. This active stage is followed by chronic hypertrophy of the papillæ, which gradually assumes a warty appearance. The growth may enlarge at the margin slowly and indefinitely. This form of tuberculosis is termed by Riehl and Paltauf tuberculosis verrucosa cutis, and is, histologically, similar to lupus verrucosus.

WHAT IS LUPUS?

Lupus is so unlike the other forms of cutaneous tuberculosis that it is not easy to recognise at once its relationship to the group. Why this should be so is still more difficult to determine : probably it will be found to depend, I think, upon some variation in the species of microphyte. A clue to the solution of the difficulty has been given us by Leloir, who has proved that lupus is an *attenuated* form of tuberculosis. There are but few bacilli at the bottom of the process, and, on that account, their operations appear to be all the more deliberate. The deliberate formation of tubercles is the essential act of lupus, the histological element out of which these are wrought being the connective-tissue corpuscles of the papillary and middle layer of the dermis. The recognition of these tubercles through the translucent covering of the epidermis is the main clue to the diagnosis of lupus. Mr Hutchinson's clinical description of them as " apply-jelly deposits " is singularly happy. This main clue is often masked by other appearances, making diagnosis more difficult.   The irritant effects of the tubercles may provoke catarrhal inflammation, or an erysipelatoid lymphangitis, but the presence of tubercle satellites decides the diagnosis. It is unnecessary to repeat what has been said of the cellular reactions of lupus. The Reader will readily comprehend that to draw a single clinical picture of lupus is quite impossible. There are many sides to the picture, and all are needed to portray the character of lupus. The observer must bear in mind the life-history of lupus-tubercle, and he will meet with

little difficulty, as his experience widens, in recognising all the variations as they arise.

LUPUS ON MUCOUS MEMBRANES.

The tubercular affections of the accessible mucous membranes are provoked by the same species of microphyte, and are formed out of the same anatomical elements as cutaneous tuberculosis.

Tuberculosis of the buccal mucous membrane may assume two forms which differ clinically from each other in a marked manner. The scrofulous or tuberculous ulcer of the tip of the tongue rapidly carries the patient to a fatal issue, and is preceded or followed by internal tuberculosis. It is painless in the early stage, but becomes exquisitely sensitive in the later stages.

Lupus of the mouth and upper air passages, on the other hand, is extremely chronic; is rarely followed by tuberculosis of other organs; scarcely deteriorates the general health, unless it be in a situation to interfere with the comfort of the patient's eating or swallowing.

The *diagnosis* of lupus in these situations may be a matter of the utmost difficulty, even to the expert laryngologist. Speaking generally, the difficulty increases with the distance from cutaneous orifice. Thus lupus of the gums is more easily recognised than lupus of the larynx. Its origin in the accessible mucous membranes may be primary or secondary. Out of 79 cases of throat lupus collated by Bosworth, 45 were preceded by cutaneous lupus. Lupus of the nose may arise by direct extension round the nostrils from the alæ, and probably from the eyelids down the lachrymal ducts. Secondary lupus of the mouth may arise from direct inoculation from the lips. The disease may gain access to the throat through the Eustachian tube or buccal cavity. Lupus of the tongue is rare either primarily or secondarily.

The diagnosis of all cases of lupus of the mucosa rests more upon pathological coincidences than on objective signs. The

subject is too extensive to enter upon at the close of this article.
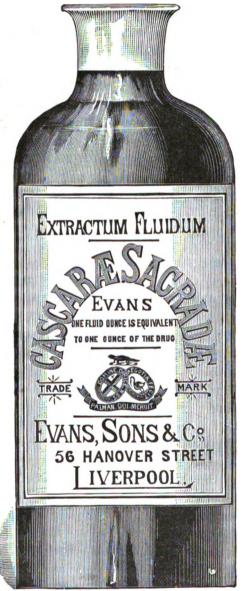
In the diagnosis of lupoid ulcerations of the mouth, I am generally guided by the cutaneous manifestations of the disease.

As regards primary lupus of the throat, it would be presumption in me to write, since I have no new light to throw on the subject beyond what is afforded by recent literature. For a lucid summary of the subject, with an account of twenty cases, I would refer the reader to the article entitled, "Lupus of the Throat and Nose,"[1] written by my colleague, Dr Middlemass Hunt.

[1] *Journal of the Laryngology and Rhinology*, September 1893.

EVANS' FLUID EXTRACTS.

PAPERS ON PRACTICAL SURGERY; OR, THE EX-
PERIENCE OF TWENTY YEARS OF OPERATIVE
WORK. By WILLIAM ALEXANDER, M.D., F.R.C.S.,
*Surgeon to the Royal Southern and Workhouse
Hospitals, Liverpool.*

CHAPTER IV.—TUBERCULAR DISEASES OF THE
VERTEBRAL COLUMN.

LOOKING back over twenty years of practice, the diseases of the
vertebral column that have come under our notice during that
time seem, at the first glance, to have been all of one variety,
viz., caries of the vertebræ, so tremendous is the numerically
greater prevalence of that disease over all the others. It is
only after some investigation that we notice the other diseases,
and hence we will devote a chapter to Pott's curvature or
caries of the vertebræ, dealing with all the other diseases of
the spinal column subsequently in much less space than it
will take to treat of caries.

Caries of the vertebræ is at present considered to be due to
the action of the same causes as the tubercular disease of the
joints of the extremities that we have already discussed in the
previous chapter, the pathology of which *now* is, that these
diseases are the production of the tubercular microbe. Whilst
this theory seems proved, and capable of explaining matters up
to a certain point, its practical import is not yet great, nor has
it in any way revolutionised the disease to practical surgeons.
We are hopeful that this pathology may be yet of supreme
practical importance when the way has been cleared of
difficulties that at present prevent any progress. Until these
difficulties are cleared away, we can only point out the direction
in which our hopes lie, and at the same time do the best we can

for our patients on the general principles that now guide us in surgical work.

Tubercular disease of the vertebræ, while of the same kind, differs in many respects from that of the limbs. These differences are due to the structure and functions of the vertebræ being so totally different from the structure and functions of the limbs, and to the extremely different relations of the spinal column and of the limbs to important organs.

Taken as a whole, the vertebral column, or, as it is called, when looked upon as a unit, the backbone, is to the general framework of the body what the keystone is to the arch, or the main building of a house to its wings. From it all the other parts proceed and depend, and without it the limbs are comparatively useless appendages. The limbs, on the other hand, may disappear or be lopped off; but whilst the spinal column and its capital are intact, the man remains with complete vitality and potential force, although deprived of locomotion. Examples of limbless mortals doing wonders are not unknown. On the other hand, disease of the vertebral column soon cripples locomotion more seriously than disease of the limbs, and, if further advanced, paralyses motion or destroys life.

Such is an outline of the general differences. We will now allude, but only in a cursory manner, to some particular anatomical and physiological differences, as the class of readers for whom these papers are written are practical men, to whom an allusion is sufficient. The details are entirely unnecessary, as they will be at once understood. The vertebral column consists of many joints, with only a small interval between each joint, and the bodies of the vertebræ that are intermediate are composed of soft, spongy bone, such bone as exists in the wrist and carpus, and, indeed, in the neighbourhood of all the joints, parts which strumous disease specially affects. But in the spine this cancellous tissue is present throughout the entire body of the bone, and it may be, and often is, entirely destroyed, the processes only being left. This never occurs in the limbs, if we except the small bones of the hand and foot, which entirely disappear from strumous disease, and for the same reason. As in

the carpus and tarsus, caries of the vertebræ spreads from bone to bone and from joint to joint—a phenomenon rare in the same disease of the other joints of the limbs. In hip or knee, elbow or shoulder disease we have only, as a rule, one joint to look after; in the spine we usually have several joints to consider, and often the number is a gradually increasing one, and greater than we during the life of the patient surmise. For example, in Pl. LIV., a great many vertebræ are anchylosed together, and
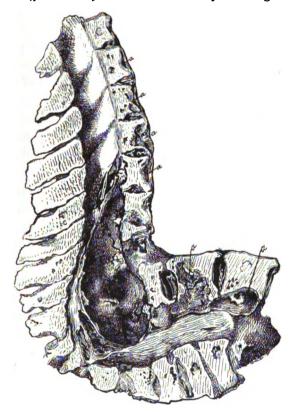
Plate LIV.

form the front wall of a large abscess filled with caseating material. At the angle in front a space existed between the bodies of the vertebræ filled up with similar cheesy products, so that there was complete solution of continuity of the column formed by the bodies of the vertebræ, a layer of cheesy pus

forming an integral part of the spinal column, instead of the usual bone or cartilage. Beyond the limits of this abscess cavity, small abscesses, *a, a, a, a, a, a,* erode the vertebræ; four of them anteriorly and two posteriorly. This specimen was obtained from a hunchback whom we knew for some years as an inmate of the workhouse. He only complained of "rheumatics" in the legs, and died of bronchitis. . We made the post-mortem in the expectation of obtaining *a well-cured spine,* as the man had not complained of his spine for many years, and had a capacious chest.

The bodies of the vertebræ being thus destroyed partially or completely, either in many vertebræ or in only one, a solution of continuity occurs, and in virtue of that solution of continuity deformity inevitably results, as it does elsewhere in the bony skeleton. We need not refer to apparent exceptions. But deformity here does more than cripple, it threatens life, first by pressing in some cases on the spinal cord, but chiefly by interference with the viscera that are suspended to the front and sides of the spine. Underlying all these mechanical troubles, we have the same septic and infective influences at work as in the joints of the limb, but at work in a more veno-vascular and cancellous region, where absorption is more favoured than in the muscular limbs. Whilst the forces tending to destruction are so powerful in vertebral caries, there are also conservative agents at work that oppose the iconoclasts, and sometimes so successfully as to cure the patient, leaving him, however, with marks of the contest which he will carry about with him for the remainder of his life. It is only one part of a vertebræ, but the major part, that succumb to tubercular disease, viz., the bodies. The laminæ and spinous processes are left more or less intact, and these are articulated together and bound to each other by ligaments, fascia, and muscles. When disease affects the vertebræ, all these muscles *fix* the separate bones of the affected region immovably, so that a supplementary and posterior spinal column is formed, composed of the vertebral arches and their processes. These parts become quite rigid, and, as we shall afterwards show why, a curve instead of a sharp

bend is the result of the loss of the main support. But with the gradual approximation of the arches, which is produced by the gradual bending forwards of the spinal column, an inflammatory change takes place in the synovial sacs of the articular processes and between the approximated laminæ and spines. The inflammatory change often results in anchylosis of the vertebræ to each other through these articular facets, and such close fibrous anchylosis between the laminæ and spinous processes, that it seems in some instances to be bony in its nature.

We have examined a large number of spinal columns obtained at post-mortems, and the variety in the condition of affairs that may be found is very great. Pl. LIV., already alluded to, showed a startling condition in a deformed but otherwise apparently healthy man. His " thread of life " was certainly very weak at one spot, but it held, and his death was not in any way directly due to this weakness. We have remains of some still worse spines incapable of portrayal in the dried state, where the seat of disease was a cheesy mass with fragments of arches and laminæ, interspersed here and there, and all kept compact and firm for a time by muscles and skin, strong ligaments and fascia. This condition we have seen most frequently in the upper dorsal region of young and delicate children, and it has often astonished us how long life could last, and *health*, though delicate, be maintained under such conditions.

In Pl. LV. we have an example of caries of the vertebræ almost cured. Let us see what has taken place. The bodies of the healthy vertebræ above and below the seat of disease have come together making an angle towards the viscera of rather less than a right angle. Small fragments of three bodies are found in the space behind the point of impact of these comparatively healthy vertebræ. *Five* arches are, however, to be found composing the projection of the back, so that two bodies have completely disappeared. Four of these arches that intervene between the letters *a, a, a, a* are so adherent to each other that they seem to have become anchylosed, and the most careful scraping and cleaning failed to discover any place where they could be disarticulated. The upper arch that still retained the

largest fragment of the body could be separated from the others, though with difficulty. It will be noticed how the recession of the arches that have no bodies to represent them permits the curvature, and at the same time maintains a clear canal for the spinal cord. We said " almost cured " in describing this specimen, for even the best specimens we possess show a
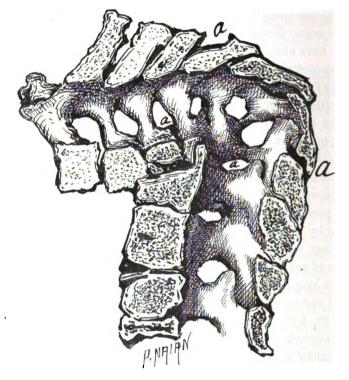

Plate LV.

carious condition of the surface of the bone ; and latent as the disease often is during life, it might, and often does, break out at unexpected times, and then pains and fever warn the patients of the insecurity of their tenure of health or life.

In Pl. LVI. this tenure of life was very insecure for a long period, and death resulted directly from fever and exhaustion. In this specimen the apparently anchylosed area included between the letters *a, a, a, a* has severed its attachments to the rest of the

spinal column, and was surrounded by inflammatory matter, such as we have described as occurring in very young delicate children. During the cleaning of the specimen, it separated into the three fragments shown in the figure. The disease was in this case chronic for years, until acute inflammatory symptoms set in, probably septic in origin, and destroyed the results of
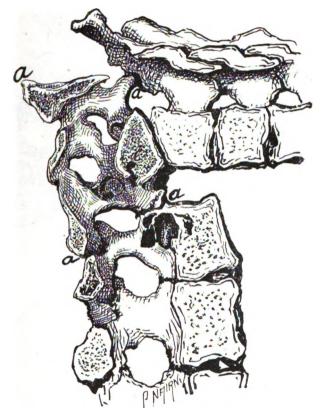
Plate LVI.

the conservative efforts that nature was hitherto making. We could not find any joint in the sequestrum, composed as it is of the amalgamated neural arches.

In Pl. LVII. the curvature is extreme, and the fronts of the bodies of the vertebræ rest upon each other for a short distance. From *A* to *A* apparently firm anchylosis was met with in this

case, and the spine was sound except for the rough carious bone previously alluded to. The spinal canal is here intact, and is, indeed, enlarged rather than diminished by the recession of the neural arches. This enlargement of the canal we have found in a good many of our specimens, and it explains the unexpectedly small liability to pressure on the spinal cord that we find in these

P. NAIRN. DEL
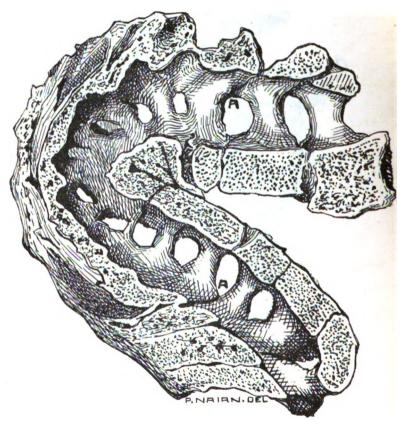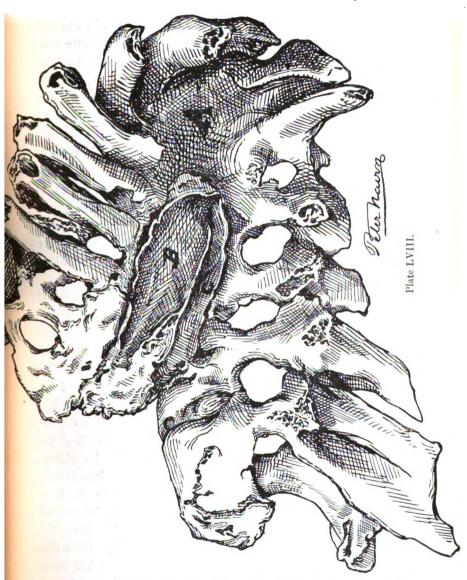
Plate LVII.

cases. Several fragments of vertebral bodies, that retained their vitality in spite of the necrotic changes that threatened them, have become consolidated into an irregular mass of light porous bone, and forms the apex of the point of union of the bodies of the healthy vertebræ at the seat of disease.

In Pl. LVIII. we have the left lateral aspect of the outside of the bodies of the same vertebræ that we have already seen in

Plate LVIII.

longitudinal section in Pl. LVII. At *A* we have the rough carious surface of the mass composed of the same vertebræ seen in longitudinal section in Pl. LVII. This carious bone is the

source of the long-continued suppuration again and again alluded to. The patient was so nearly cured, and yet complete healing is so slow that only comparatively few patients survive the process.

The letters *B* and *C* in Pl. LVIII. are placed in the aorta laid open, and the plate illustrates a very interesting deformity seen here in its most extreme condition. The aorta, carried down by the spine, lies acutely flexed upon itself; so much so, that for short distances, more than half an inch, the contiguous walls are seen to lie close together and to appear as one. The stream of blood, in a very early part of its course, and when it is flowing swiftly, was here suddenly compelled to reverse the direction of its current, and the sudden check must have proved a severe strain upon the circulation. However, no phenomena due to this condition were noticed during life, nor does the sharp curve seem to have produced any tendency to aneurism at the point where the diversion of the direction of the current must have been attended with a great and constant impetus of blood against the walls of the vessel.

We have referred to the extensive destruction of the spinal column that we have found consistent with life and even health. Some others of our specimens illustrate the very opposite condition, viz., how small a lesion of this region may prove fatal. In one spine a small excavation in the left side of the 3rd lumbar vertebra, that did not penetrate to the centre of the vertebra, and the walls of which were only slightly carious, had produced an enormous abscess that subsequently burst externally, became septic, and by its everlasting drain killed the patient after the usual symptoms called "hectic." The original disease was nothing, the secondary disease of primary importance. In another specimen the body of a dorsal vertebra has been half destroyed by caries. Its contiguous discs have disappeared, and the adjacent bodies have united firmly with the relic, partly by fibrous and partly by osseous anchylosis. From this seat of disease, or rather site of where the disease had been, pus had crept upwards and downwards along the sides and front of the spinal column, and killed the patient in the same way as in the preceding case.

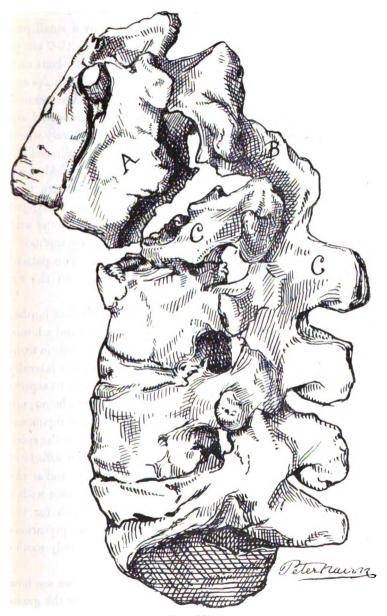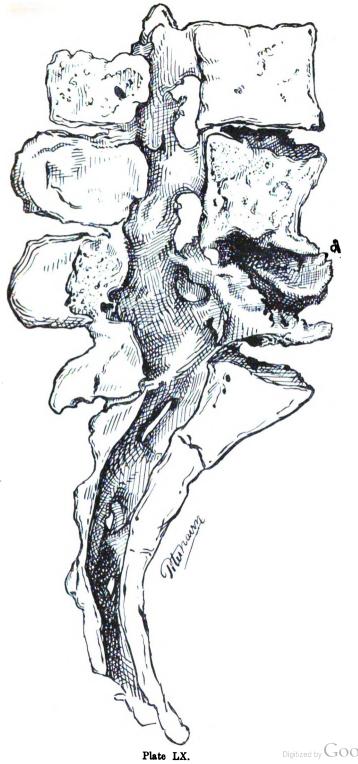Still more extensive disease is seen in Pl. LIX., which repre-

Plate LIX.

sents a portion of a spine diseased at the lower dorsal region. The

vertebra marked *A* is intact in all its parts, except that its lower cartilage has disappeared. *B* points to the remains of the next vertebra below, which is only represented by a small part of the pedicles, the laminæ and spinous process. *C, C* are on the remains of the next vertebra, which consists of about one-third of the body, of the carious but undiminished pedicles and of normal laminæ and spine. The next vertebra was normal, and the sound one above impinged on front on the sound one below, a ledge and groove marking the points respectively where these came in contact. A large gap at each end allowed the products of disease to emerge from the neighbourhood of the spinal cord, and acted as a safety-valve to over-pressure from purulent retention. The bones are especially dense and hard, and at the point of contact there existed a kind of joint with slight movement in an antero-posterior direction, and the movement was effected probably without much pain. The patient died, like the others, according to nature's plan, from the exhaustive effects of prolonged suppuration.

In Pl. LX. the disease is limited to the body of the last lumbar vertebræ, which is split up into two halves, an upper and a lower, by an irregular channel that discharged its contents chiefly in front of the body just above the brim of the pelvis, but also laterally by small apertures on the sides of the vertebræ. The front aspects of the bodies of the vertebra above and of the sacrum below, not seen in the plate, are irregular through ossification of ligaments and periosteal inflammation. There is no deformity of the spine or any displacement, but the patient died from the effects of sinuses that fenestrated the tissues in all directions; and at the time the patient came into hospital, we were face to face with a labyrinth of purulent streams that rendered a search for the fountainhead of the disease perfectly hopeless in the precarious condition in which the patient then was. We could only soothe and nourish as far as possible.

In Pl. LXI., from the mid-dorsal region in a child, we see how the healthy bodies (*A* and *A*) have come together over the grave of three vertebræ. The remains of the bodies of two (*c, c*) out of the three diseased ones are represented by small fragments.

Plate LX.

The third body has entirely disappeared, but the pedicles and laminæ can be seen. The vertebral canal is capacious, but the outer aspect of the whole region depicted in the photograph is
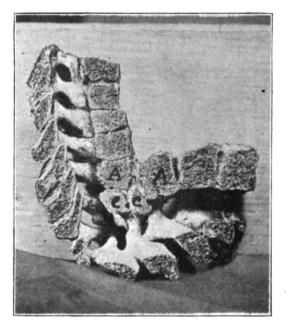

Plate LXI.

rough and carious, with its component parts more or less ossified or anchylosed into a solid piece.

P1. LXII. represents a specimen where the disease was confined to the adjacent sides of the 3rd and 4th lumbar vertebræ and the intervening cartilaginous disc. The combined 3rd and 4th vertebræ, which are anchylosed together by their pedicles only, are smaller than the 5th and a little larger than the 2nd vertebra, and between the fragments of the bodies left by disease an irregular cavity is formed, wide in front and narrow behind, so that the diseased products could escape readily in a direction away from the vertebral canal. In the adult these diseased products generally emerge at the sides where the ligaments are weakest and most fenestrated, and rarely travel upwards or downwards beneath the common ligament. In

childhood more stripping of the periosteum and ligaments seems to take place. A slight cyphosis and a correspondingly slight prominence of the lumbar spinous process was observed in this case. The abscess was a lumbar one, and had been treated by

Plate LXII.

a so-called expectant method that did not require much trouble, or, at least, did not get much attention; the patient was always described as doing well until it was found that death by pyæmia was spoiling the case.

In Pl. LXIII. the lumbar vertebræ between *A* and *A* impinge upon each other by their bodies at a single point, where bony anchylosis has taken place. The transverse and spinous pro-
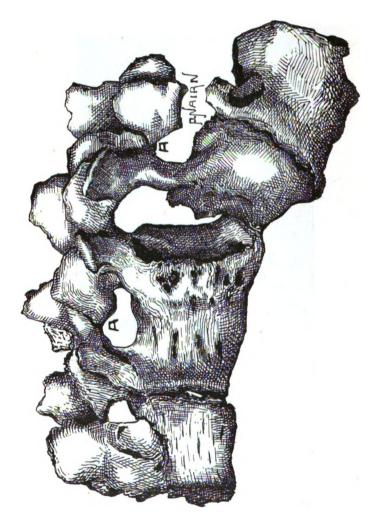
Plate LXIII.

cesses are firmly bound together. A radical cure has here resulted without much deformity, but death occurred all the same through suppuration and its train of consequences.

In Pl. LXIV. the face of the internal longitudinal section is seen. Two-thirds of the vertebra below and one-third of the vertebra above have disappeared, the spinal canal is dilated opposite the

peter naiρn.
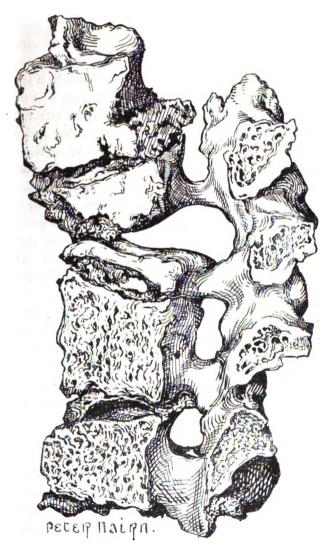
Plate LXIV.

disease, and the diseased bodies have receded.   On the outside, excavations in the body of the lower of the diseased vertebræ are

seen.   This has irritated the adjacent intervertebral disc, and
prominent masses of new bone bind the lower diseased vertebra
and its neighbour by a rough ridge that extends from the pedicle
to the front of the body just above the lower letter *A* (Pl.
LXIII.).

The amalgamation of the vertebræ produced by caries has
been already illustrated by several of our plates.   The extremes
to which this amalgamation will go is well shown by a specimen
in my possession, but which is so irregular that it is not easy
to transfer it to paper in an efficient manner, either by the
pencil or camera.   It consists of the last lumbar and all the
sacral, and probably coccygeal, vertebræ, combined together to
form a single, solid, but very light piece of bone.   The bodies of
the sacrum and coccyx are completely lost in a lava-like mass.
The laminæ are inseparable, but the spinous processes project,
and are distinguishable.   The body of the last lumbar vertebra
is natural in size and shape, but below that the amalgamated
bodies, pedicles, and laminæ form a shell covering a very large
spinal canal.   A large opening, capable of admitting the little
finger, intercommunicates with the spinal canal and with the
hollow of the sacrum, which is very hollow indeed.   The speci-
men has to the fancy the appearance of being formed by the
melting and running together of the osseous tissue of the sacrum,
and which afterwards cooled into the irregular and gnarled bone
which we have described.   It has, no doubt, been really formed
by destructive and reparative changes going hand in hand.
New bone is formed by the irritation of the decaying diseased
bone.   The movements of the patient, the pressure of collec-
tions of morbid matter, and the presence of the indestructible
cauda equina are agents that determined the final result.

In only one case amongst our fifty specimens did we find a
piece of bone pressing upon the spinal cord.   It had become
dislodged backward, and produced paraplegic symptoms.   The
destruction of bone and soft tissues was very great in this case.
In no case did the curvature *per se* compress the spinal cord.
Inflammatory products in all other cases were the agents that
compressed the cord, such as thickened posterior ligaments and

membranes, or collections of pus that could not get away; and the paralysis was sometimes due to inflammation creeping inwards and producing softening of the cord itself, accompanied with meningeal and myelitic symptoms.

We will illustrate this part of the subject by a specimen taken from a case of compression of the cord, the result of a fractured spine, as a contrast to what takes place in the curvature due to caries of the vertebræ. The fracture was in the lower dorsal region (12th dorsal), and the patient came to us from the Northern Hospital, where perineal cystotomy had been performed, and the patient ever after used the perineal wound, wearing a vulcanite tube.

In the photograph of the spine (Pl. LXV.), it will be seen how different is the mechanism of the curvature in these cases.

Plate LXV.

The lower fragment is carried forcibly backwards, so that the lower part of the body of the fractured vertebra blocks completely the spinal canal of the upper fragment. The cord was

ruptured clean across, and recovery hopeless. He lived about
ten months after the injury, but a very painful, miserable life.
The injury is as much a dislocation as a fracture, and a forcible
carrying away of the lower fragment past the upper; quite
different from the gradual curvature, close imbrication of the
laminæ, and recession of the neural arch, by which the spinal
canal is kept intact and out of the way of the disease in caries.

Pl. LXVI. represents the lower limbs of this patient about eight
months after the injury. They are quite rigid, completely para-
lysed and wasted. Trophic changes have occurred in the skin,
toes, and hair, whilst brown crusts and discolorations disfigure the
skin. A tendency to dislocation backwards of the knees is seen,
and more markedly the incurvature of the soles of the feet, the
extension of the ankles, and the flexion of the toes. This patient
suffered excruciating pain down the legs. Another patient, a
younger man, did not suffer at all, although in neither patient
was any sensibility to touch or to pricking present.

The paralysis of the lower limbs produced by vertebral caries
in a boy, æt. 11 years, is well shown in the next photograph (Pl.
LXVII.). Both limbs were rigidly fixed in the straight position,
and the feet extended upon the leg. Sensation was perfect.
The boy had considerable pain when he moved; no trophic
changes had occurred, and the skin was quite natural and clean.
He came to us in this condition from a neighbouring hospital with
double incontinence. A modified Sayre's jacket was put on, and in
the course of a month movements began to come back. These
gradually increased in force and extent until he was able to walk.

He is now (about eight years after his admission) at our con-
valescent home at Maghul, where he walks about with the aid
of crutches. He can, however, walk alone, and only uses the
crutches to rest himself. The back is quite firm, and he has
not had a support for between three and four years. The kind
of jacket used in this case, and which was very effectual when
the ordinary Sayre's jacket had failed, will be described in the
treatment.

We will illustrate these paralyses from spinal disease by two
interesting cases :—

CASE I.—John J., æt. 47, began to suffer on the 1st of December
1874 with pains in the right shoulder, and on the 17th of that month

Plate LXVI.

an abscess formed at the inner side of the right deltoid muscle a little
below the shoulder-joint, and opened spontaneously. We saw the
case on February 5, 1875, when a sinus existed at the site of the

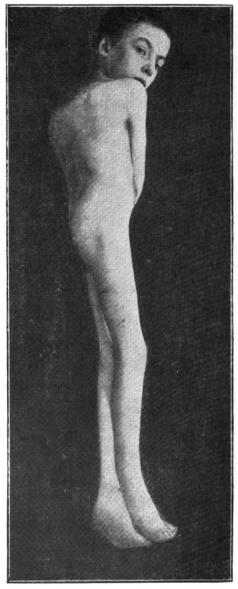abscess we have described. We could not find any diseased bone,

Plate LXVII.

but suspected its presence about the shoulder-joint. The articulation, however, appeared sound.

In May two other abscesses had opened above the elbow, and in June another had formed below the elbow. On June 3 he was suffering from pyæmic symptoms, but under free openings of sinuses, carbolic lotions, &c., he recovered and kept fairly well till January 17, 1876. He then complained of pains in his shoulders, could not turn his head, and an abscess appeared below the right breast. The sinuses in the arm were dry or healed at this time. The subpectoral abscess was aspirated and relief obtained, until July 12 when the abscess was again emptied by the aspirator. On March 25 the patient had a violent fit of coughing, which dislocated the inner end of the right clavicle. This was reduced and kept in position by a pad and bandage. On April 27 abscesses had formed above both clavicles. On May 14 these and the arm abscesses were all discharging, and the patient was extremely emaciated, restless, thirsty, and vomiting.

On June 17, we first noticed some deformity about the upper dorsal spine, and the patient complained of much dysphagia, pain, and stiffness in the neck.

On June 21, in the afternoon, he felt a numbness in the left shoulder, which gradually extended down the arm to the hand. This was followed by complete paralysis of motion of the arm and forearm. He could move the fingers slightly. Sensation was quite unimpaired.

June 24.—The left side of the body is now quite paralysed ; can move the fingers of the right hand slightly ; cannot move the fingers of the left hand at all. Sensation apparently normal, but patient very ill. Feet cold and blue. He died 12.25 o'clock midnight.

An autopsy was made on June 26. The neck, right arm, and breast were riddled with abscesses and old sinuses, all of these by most circuitous routes led to the front of the bodies of the 3rd and 4th dorsal vertebræ, the osseous tissue of which was broken up into fragments that partially floated in the pus occupying the space.

The anterior columns of the cord were thickened and gelatiniform, and the whole cord was pressed to the posterior part of the spinal canal by the abscess ; the dura mater opposite, as well as above and below the abscess, being much thickened. Some evidence of commencing amyloid changes in the solid organs ; lungs quite healthy.

CASE II.—Bernard C., æt. 16 years, came into the Royal Southern Hospital on May 2, 1892, complaining of pain in the head, and inability to hold it up.

He had a fall off a pony last September, being pitched from his seat to the ground on his face. Since that time he has never been well, and before that he does not remember being ill.

Family History.—Mother died of consumption ; father subject to bronchitis. He is an only child.

As early as March a plaster jacket was applied at a Liverpool hospital, so that signs of spinal caries must have been observed then. Some time after a post-pharyngeal abscess was opened by another surgeon, and another apparatus applied.

On May 2 the following is the report of his condition :—He complains of pain extending from the back of his head down to the 7th cervical vertebra. Upper spinous processes appear to be more prominent than usual, and there is an œdematous swelling behind the left ear. The movements of the neck are quite abolished, and when he wants to turn his head he has to turn the whole body round ; pulse weak ; body emaciated ; appetite good ; tongue furred, and protrudes to the left side—the left half of it being smaller in size than the right. •

On May 19 the swelling behind the mastoid process was opened, and pus was found deep down beneath the muscles. The sides of the bodies of the occipito-altoid bones were bare, soft, and carious. The abscess cavity was carefully scraped out with a Volkman's spoon, washed, and drained.

On May 26 the pains in the head had disappeared, and the patient seemed quite comfortable. A plaster jacket was now put on, with supports for the head, and he was able to get up in a chair for two hours daily.

On the 12th of June he began to complain of numbness in the arms ; on the 13th the power of flexion in the elbow was greatly diminished ; on the 22nd some difficulty in speech and slight paralysis of the lower facial muscles was noticed ; and on the 24th he could only flex or extend the fingers with difficulty.

July 1.—Can only move the ring and little fingers, and these very slightly, and the thumb and first and second fingers of the left hand to the same extent. No sensory paralysis anywhere. Taste lost on left side of tongue.

July 5.—Power of movement in fingers a little less ; inclined to be sick after food. We now expected a fatal issue every moment from interference with medulla, but the condition remained the same for a week, till July 13, when he complained of tenderness all over, requiring frequent change of position. Lotion to-day came through

the mouth when the mastoid wound was syringed. Power in fingers improved slightly.

July 21.—Is now able to lift both arms a little ; takes food better. Massage has been applied for some time to his wasted muscles.

September 1.—A new plaster jacket was applied, and on September 20 an abscess had formed below *right* ear. This subsided, and his condition was variable till February 1, 1893, when the following report was made :—" Patient lies on his back fixed in plaster jacket, with back support for head. Wound at each side of neck discharging a considerable quantity of pus ; dressed daily. He is able to flex knees to a right angle quite easily, but has very little power in his legs. Cannot flex foot to a right angle ; tendency to 'drop foot.' Movement of feet and toes very good. He can easily raise his hands up to his head, and the movements of all the muscles are perfect, but very much limited in power. Cannot move dynamometer. A very little drawing of side of mouth when patient laughs, otherwise no facial paralysis observable. Tongue is protruded still to the left. Taste almost recovered, but sometimes unable to detect sweet and salt with left side of tongue. Face fat and well-nourished ; body much emaciated ; appetite good. Somewhat hectic temperature, 97°–101°. Sinuses discharging at both sides of neck."

The improvement was maintained, and our hopes of his final recovery were good until May 20, 1893, when a cold abscess formed on the back of his left hand. It was opened and contained thin pus. The following photograph was taken at this date. On the 24th a second abscess formed below the posterior annular ligament, and was opened.

On June 19 diarrhœa set in after eating strawberries, and blood was observed in the motions. In spite of all remedies it continued unchecked until August 9, 1893, when he died.

The accompanying photograph (Pl. LXVIII.) shows poor Bernard about two months before he died. He has on a plaster-of-paris jacket, from the back of which bars are seen going up to the back of the head to form a support. The tongue is protruded and turned to the left, and the left half is seen to be very small. An abscess is seen on the back of the wrist. No post-mortem was allowed ; but, no doubt, several of the upper cervical vertebræ were carious. The extent and completeness of the paralysis in this case was very great, and just when it had advanced so far that the phrenic or medulla was threatened the disease receded, and the boy died from pyæmia and diarrhœa.

The seat and extent of disease prevented any further surgical operations than those intended to allow a free escape of the pus. The extreme pain he suffered from on admission was thus completely relieved.

The *symptoms* of caries of the vertebræ need not be exhaustively enumerated here. We will only call attention to some of them, as they have fixed themselves on our minds.

Plate LXVIII.

" Lumbago," " rheumatism," and " neuralgia " of the back and loins require to be looked into. We remember one case of " lumbago " in a man, æt. 50, that, to the confusion of the medical attendants, turned out to be lower dorsal caries, and whose symptoms were almost at once relieved by the application of a plaster jacket. It is now six years ago, and at present the patient is alive and apparently well, as far as the spine is concerned.

About a dozen years ago another patient, whose spine we now possess, exercised the wisdom of a hospital staff, the diagnosis varying from malingering to the most obscure and rare diseases of the spinal cord. The characteristic deformity in the upper dorsal region soon afterwards showed that all the opinions were astray, and illustrates the necessity of keeping vertebral caries well in mind in all symptoms of disease pointing to the spinal cord or back. On the other hand, we possess a spine taken from a young child who had a prominent upper lumbar vertebra, and who wore several plaster jackets. The child died of a wasting disease, and no caries were found, the spine simulating disease through a vicious attitude, acquired by bad nursing. The child was made to sit erect too soon, before the spine could bear the strain.

Stiffness of the back and the absence of the sinuous bending and straightening of the spine as the patient stoops and again resumes the erect attitude are the most reliable early signs of the disease. Sayre's plan of endeavouring to elicit pain by pressure on the lateral aspects of the ribs is often successful, but not quite reliable, either as a negative or positive symptom. Tapping the spinous processes sometimes gives pain in spinal disease, but acute pain is sometimes experienced in tapping the spinous processes of the vertebræ of the neck in neuralgic and hysterical patients, where no caries is to be found. This sign has, therefore, to be received with care and caution.

A delicate look of the patient, anæmic lips and eyes, breathlessness, and general appearance of ill-health precede the more characteristic symptoms, if parents and guardians had experience to detect such changes. At any rate, we have always found them present when the disease has been diagnosed, no matter how early the stage. The different attitudes the patient assumes, such as that in the advanced cases in Pls. LXIX. and LXX., or with his two hands leaning on his knees, or the chin supported on the hand, are characteristic. His method of getting up or sitting down, or of turning on his side, are often also diagnostic. The more "shocking" methods of diagnosis, by making the patient jump down from a height, are only mentioned to be condemned.

In the cervical and lumbar regions deformity of the spinal column is not always, or even often, found as an early characteristic symptom. A case, diagnosed as "ozæna," had been treated as such for several months, until symptoms of pressure on the medulla showed that the supposed ozæna was really caries of the bodies of the atlas and axis. Rest and a special collar cured the
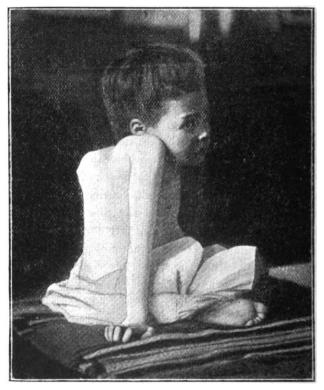

Plate LXIX.

patient, leaving a stiff joint behind. This she considers a great improvement on the abominable smell that formerly tormented her, both physically and mentally. Had it not been for the paralytic symptoms the case might have ended as a cured ozæna, although the false diagnosis and its appropriate treatment nearly killed the patient.

Several cases of lumbar caries have presented themselves to

us as abdominal tumours, where no signs of spinal disease had ever been experienced. A swelling forms in the abdomen, sometimes filling the whole lumbar and iliac regions, and pressing all the organs out of the way even to beyond the middle line.
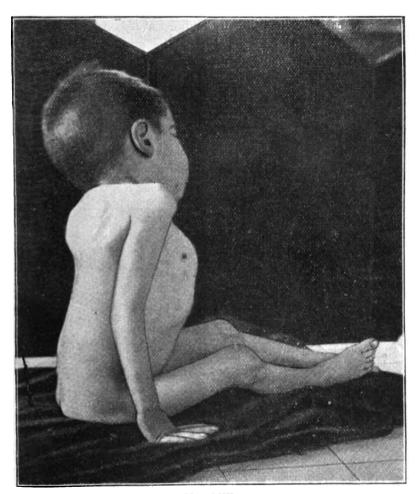
Plate LXX.

The great cavities thus formed contain pus, but no more symptoms are produced than if the patient carried the pus about in a sac suspended outside the body. Another patient consulted us for a tumour of the inner side of the thigh

extending to the knee, which turned out to be an abscess connected with the lumbar spine that had travelled down along the psoas muscles. In none of these cases was there at first sufficient spinal deformity to call attention to the lesion.

The following photographs illustrate the final results, clinically, of caries of the spine in the different regions of the body. Plates LXIX. and LXX. also represent advanced cases, and illustrate various points in spinal caries.

Pl. LXXI. shows caries of the mid-dorsal region, secondary to hip disease, and for which the affected limb had been amputated at the hip-joint some years before the spinal disease showed itself.

Pl. LXXII. shows a combination of mid-dorsal caries and hip disease in a very bright little girl, the pet of the ward, and who was always very happy in spite of her weak constitution. Her

Plate LXXI.   Plate LXXII.

attitude as regards the right hand and foot are very characteristic. She died of pleurisy, regretted by all ; and hardened as we were, we could not bear to make a post-mortem on her.

Pl. LXXIII. shows caries of the mid-dorsal region, secondary

to an ancient sacro-iliac disease. Both diseases are apparently cured, and the girl was discharged from hospital soon after.

Pl. LXXIV. shows a peculiar egg-shaped trunk, the result of lower dorsal caries and a pot-belly. This is often seen in
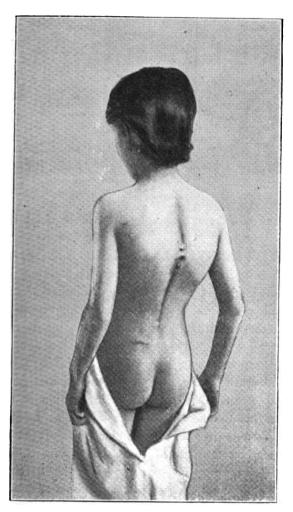

Plate LXXIII.

dorsal caries in childhood. The organs occupy the middle of the body, and the shoulders and pelvis look pointed.

Pl. LXXV. shows the disease in the same region; the

spinal angle is very prominent, but the abdomen is not dis-
tended, and hence the appearance is quite different. This

Plate LXXIV.

patient is an adult, and the angle is made by much straighter
lines than usual.

Pls. LXXVI., LXXVII., LXXVIII., and LXXIX. show ex-
treme deformity in apparently well-cured spines, and illustrate
the different methods by which nature maintains the erect posi-
tion, and allows the rest of the body to arrange its equilibrium
in view of the curvatures that take place after disease of the
vertebræ.

The arms appear to be very long in Pl. LXXVI., owing to
the vertical crushing together of the thorax, and the viscera
must have considerably changed their position in this case.
The aorta must be nearly as much curved as in Pl. LVIII.
His stomach and liver are well under cover of the ribs, and
the abdomen is not prominent. He suffers from chronic bron-
chitis, and has been under observation for years. His brain is
quite active, his large head is down on his shoulders, and his
sufferings have given him a look of premature old age.

In Pl. LXXVII. (two views) the chest is less prominent, but
the abdomen more distended, and the longer neck has to crane
forwards more. It will be noticed how his arms and hands
tend to swing forward to maintain easily the erect position.

In Pl. LXXVIII. the dorsal curve is supplemented in front by a full abdomen, and the arms look elongated, as in the other cases, from their proximity to the shortened body. The head and neck are well poised.

The contrast is marked between this case and that shown in

Plate LXXV.

Pl. LXXIX. In the latter the disease is higher up, the cervical spine curved, so that the head has almost settled on the shoulders. The chest is most prominent, and the abdomen scarcely as pro-

minent as is natural at the age. In all these cases the body is shortened, the chest and abdomen less capacious vertically, and must be proportionally more capacious laterally. The greatest

Plate LXXVI.

width exists generally on a more or less horizontal line running through the angle of the curvature, but it will be seen that this line will slope upwards or downwards to a small extent. For instance, in Pls. LXXVII. and LXXVIII. it slopes downwards;

in LXXV. and LXXVI. it is almost perfectly horizontal; and in LXXIV. it sloped upwards. The latter photograph does not illustrate this point.

The *treatment* of spinal caries, like tubercular disease elsewhere, is general and local, or constitutional and surgical. About the *general treatment* we are all agreed. Fresh country or sea air, good nourishing food, regular hours, a bright and pleasant
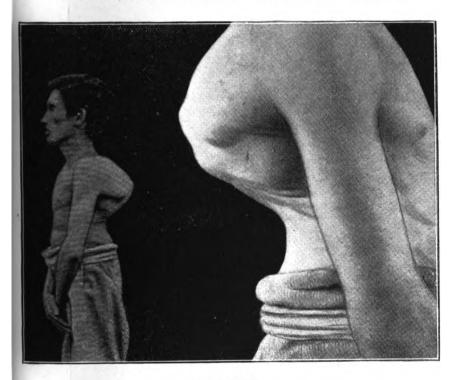
Plate LXXVII.

life, temperance, cleanliness, and warm clothing are the chief indications. Speaking generally, sea air is probably the most useful, but sometimes it disagrees, and country or mountain air is to be preferred; the place should be bracing but not cold, a relaxing climate being the worst of all. In a suitable habitat the appetite will improve spontaneously, and should be satisfied with good but easily digested food, and not pampered or cloyed

with unnutritious or tempting sweets, as is too often the case.
We cannot too strongly protest against the practice of relatives
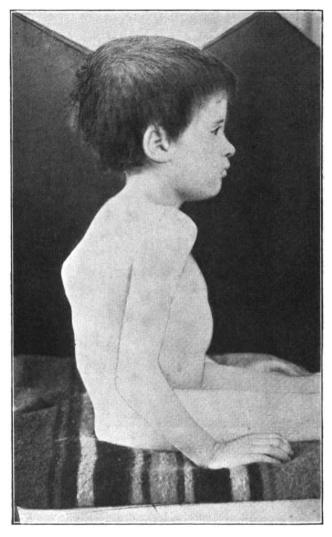and friends who, in pure kindness of heart, supply sweetmeats

Plate LXXVIII.

to those invalids and spoil the appetite so much to be depended
on in maintaining and promoting the nutrition of the body.

Milk is one of the most generally useful articles of diet; eggs come next, but are not so certain to agree; then chicken, fish, mutton, and stronger meats if they can be digested. We do not think stimulants are ever required for children with spinal caries, but in the case of adults accustomed to wines or malt
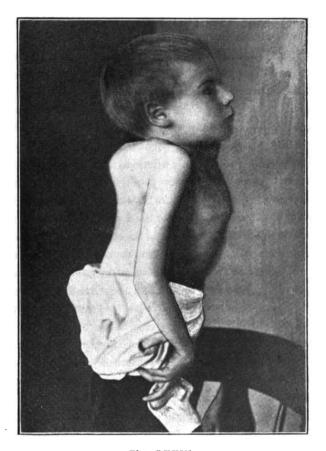
Plate LXXIX.

liquors to their meals, we would not interfere with the custom, and sometimes recommend their use. Anything approaching an intemperate use of alcoholic beverages is positively harmful, and altogether we think alcohol can be safely dispensed with in spinal disease if it is so desired.

In treating children, we would emphasise with what may seem to be unnecessary force, the importance of cleanliness, early hours, and kind moral discipline. These patients are such objects of pity that they are often hopelessly spoiled in every way, and they rule their guardians in a manner very prejudicial to their own interests. A good, kind, firm nurse often proves a blessing in disguise to the wilful patient, is a comfort to the relatives, and a credit to the doctor.

It is, however, a dangerous experiment to remove these little patients entirely from the influence of those upon whom their affections are placed, and to substitute an atmosphere of cold science for that of love. Fortunately, our nurses soon supply the needs of the little ones, and their little affections have fresh supports to lean upon. But we have seen some children pine and about to die in hospital, where a mother's care, although uninstructed and rough, has rapidly revived the drooping spirit. We have one little fellow in our minds where, although outwardly apparently contented, his heart was breaking to get home, and once there the change in his condition was miraculous. In hospital he went from bad to worse, and death seemed imminent. After a few weeks in a poor room at home, with not so good food as in hospital, and very indifferent dressings, we could scarcely believe him to be the same boy, so rapidly had his disease got well owing to his improved spirits.

When the little ones are sent to the country, strict precautions have to be taken to introduce them to their new habitat gradually and cautiously. Exposure to bleak winds, sitting on damp grass, over-fatigue, over-exposure to a hot sun, too long hours out of bed, over-eating, unaccustomed food, or fruit, excitement at the change, may cause irreparable damage to the patient, and more so in spinal caries than other forms of tubercular disease. We have known children lose their lives from some of the above accidents, and in convalescent homes there is not always sufficient care taken in looking after such cases in the way we have indicated. At first these patients should be treated exactly as at home. The fresh air should *visit them* in their warm cot or room, and when accustomed to this, they should be

taken out to meet the air in arms or carriage. Then as the child improves, more and more freedom may be given as regards locomotion, provided the spine be supported safely by some of the methods presently to be described. The same principles apply to the food. At first, as at home, then gradually increased in quantity and strength as the child can take it. Many children have been injured, and some killed, by strong milk, cream, and eggs administered by fond mothers through mistaken ideas *about keeping up the strength*. The clothing requires close attention, so as to be sufficient to prevent chills, and not too heavy to weaken the patient by keeping the body too hot. Sea-bathing should never be undertaken without precise and careful directions about each individual case, as in no disease can so much harm be done by ignorant people in so short a time as in this by sea-bathing. The apparatus worn may preclude complete sea-bathing, when the arms and legs may be sponged, or supports for these spinal cases may be worn for the purpose. Sometimes special baths are provided in which the child can be laid ; apparatus for these purposes we need not here describe. The water should be warm at first, then tepid, cool or cold as the patient can bear it, but it is always safer to carry it out under the observation of a local surgeon, as inexperienced relations and friends so often make mistakes, and the children when convalescing are so wilful and so liable to be a little beyond control. If not quite certain about the care taken of any given case, the best way is to forbid bathing altogether.

Medicinal Treatment.—This is undoubtedly, in our experience, of the least importance—cod-liver oil, malt extracts, pancreatic emulsion, and similar aids to dietetics are, we think, useful, but not so prominently and manifestly useful as change of air and good diet. The syrup of the iodide of iron, Parrish's food, iron and quinine are types of the iron salts most commonly used, and, we think, generally with benefit. We have used sulphide of calcium and chloride of calcium on the supposition that they tend to lessen suppuration, but we have never found any good reason to think that they were effectual. The

sulphocarbolates seemed useful sometimes in pyæmic cases, but
are inferior to quinine as a routine remedy.   In slight feverish
attacks, liq. am. acetatis and antipyrine in small doses, often
repeated, relieves the burning heat and headache by promoting
perspiration.   The hypophosphate of lime has done good in
many of our cases, especially adults, and fortunately in those
where iron and quinine were not tolerated well.

As cases of spinal caries are necessarily sedentary in their
habits, they require mild aperients occasionally, and such selec-
tion and arrangement of the diet as will tend to a regular
movement of the bowels.   In later stages of the disease recurrent
attacks of diarrhœa require as great care, and the surgeon is
often doing more good by attention to these humble details
than by more ambitious efforts with higher-sounding names.
It is not necessary to particularise, but the simpler the aperients
or astringents employed the better.

The *local treatment* of spinal disease is of the greatest im-
portance, and here we come upon the most debatable points.
There are those who fix the spine by special methods of their
own or other people's invention, and say that is all that can be
done ; the patient must either sink or swim by means of this
or that appliance.   Others remove the diseased areas com-
pletely, obtain union by first intention, and send the patient
out of hospital sound in a few weeks.   Then we have had hyper-
distention of abscess cavities, iodoform emulsions, carbolic
swabbings, drainage, and other things too numerous to mention,
put forward, each in turn, as the palladium of treatment of
spinal caries.

Amidst the clash of arms of the contending parties and the
sound of the trumpets of each of these advocates, we have pur-
sued the even tenor of our way, quietly studying our cases, and
comparing them with the statements made, adopting any sug-
gestions that seemed feasible and safe.

The result has been the adoption of the following resources
in our efforts to cure or relieve spinal caries :—

We first of all fix the spine.   If the child is very delicate, or
has any sores or abscesses, rest in a well-prepared bed is

sufficient, and in lumbar caries it is all that in some cases is ever necessary. The lumbar vertebræ are so interlocked that no support to keep the body straight is generally necessary, and rest in bed most easily relieves the lumbar spine from the weight of the superincumbent body.

Since Sayre introduced the plaster-of-paris jacket, we have used it as *the* support for spinal caries, only using felt or poroplastic counterparts of the plaster jackets when the cure was so advanced that a more removable, though less effective, support could be used with safety. We have tried many instrumental supports. Some have a certain amount of merit, and are very useful, and are sometimes sufficiently useful if the recumbent position is also maintained. But no instrumental support that we have ever met with gives the same security and repose to the diseased spine that a well-applied plaster jacket gives, and at the same time allows the patient to move about with the same amount of comfort and freedom that a plaster jacket does. But the plaster jacket, to be of use, must be properly applied, and my experience of its application at the present day is, that it is rapidly becoming a lost art. Soon after Sayre's propagandising tour, men vied with each other in the excellence of the plaster supports they could make. Now, we sometimes see a comparatively narrow and light band of plaster round the waist called a jacket, and again we have a barrel-shaped apparatus applied that might be pulled off and on over the buttocks, and which the patient can shift up and down and around when it becomes uneasy owing to pressure upon any one spot. Again, we find them so light and broken that they are useless, or so heavy as to be fatiguing.

As regards suspension during the application of the jacket, we do not think it necessary to put the patient through the severe ordeal in regard to this that Sayre thought necessary. Suspension should be sufficient to raise the ribs well, and to extend the spine as far as it will go without straining the diseased structures. Sometimes holding a cross-bar by the hand is sufficient, and in the case of children, the prone position in a Davy's hammock, made of " scran," is by far the best.

The jacket should in all cases embrace and overlap the iliac crests and the lower angles of the clavicles, and should never embarrass the arms or the legs, or interfere with the patient in sitting down. By a sufficient packing of wool the pit of the stomach and the front of the chest should be allowed full play, and the iliac crests, if sparsely covered by fat, should have a protecting covering of wool also. The jacket should fit well without being tight, and should be of sufficient strength without being heavy, the number of bandages (six to ten) being in proportion to the size and development of the case. The plaster above all things must be good, well ground, and fresh, and the bandages well rolled to permit of the rapid absorption of water. Too much plaster should not be used, as it makes the jacket too heavy and brittle. A proper admixture of bandages and plaster makes the lightest and strongest jacket.

The jacket can generally be worn two or three months, when it should be taken off, the patient allowed to rest in bed for two or three days, the skin being well washed and bathed in spirit before a new jacket is applied. After three or four plaster jackets have been used, a well-applied poroplastic should be made as like the plaster jacket as possible, and without any of the fandangos that instrument-makers are so fond of applying, that appear innocent, becoming, or comfortable, but that often are opposed to some of the main principles upon which . the application is recommended.

In the convalescent stage of lumbar caries and all the stages of dorsal caries, up to the mid-scapular region (3rd and 4th dorsal vertebræ), such a jacket as we have described secures efficient fixation.

When the disease affects the first four dorsal or the lower cervical vertebræ, then the head must be steadied. This is sometimes done by a collar round the neck, or a jurymast. We have long discarded both, and the boy shown in Pl. LXVI. was a test case for the improvement we are about to describe. This boy came to us from another hospital, where, under treatment, he became "paralysed." Believing that the jurymast was too "springy" as well as unsightly, and the collar too slippery, we

devised the following plan, which we have used ever since for these cases:—The neck and shoulders were well covered with cotton-wool, and a ring of plaster put around the neck, so as to support comfortably and effectually the chin and back of the head. The ring was maintained in position by bars of plaster in front and behind that attach the ring above to the ordinary . plaster jacket below. We rarely now use plaster, but have a soft moulded ring of soft iron, well padded, that fits under the chin, the mastoid and occipital regions. This is held in position by bars that fit into the plaster jacket, two in front and two behind. A "muffler" round the neck completely conceals the appliance, and it is extremely useful. Case LXVI. improved from the first day this modified plaster casing was applied, and we believe he owes his life to it. When we can discard the plaster for the poroplastic, the bars of the head-support are fastened to the poroplastic jacket.

When the spinal caries affects the upper cervical region, a well-padded, well-fitting collar for the neck is sufficient, except when abscesses form, when arrangements of iron bars to support the back and head, as in Pl. LXVII., where the bars were supported by a plaster jacket.

In some cases we have used a padded frame-work of iron bars alone, but they are so irksome and shifty when compared with the jacket, with the bars attached, that the additional trouble is well repaid by the increased security, comfort, and convenience for nursing.

The great advantage of the jacket that we have described is the rest thereby afforded to the spine, and at the same time the exercise allowed to the patient. But the amount of exercise taken after the application of a jacket is sometimes excessive, and should be limited, especially at first, and never pushed to the extent of fatigue. The watchful care of mother and nurse are to be directed to this point, and with the caution that too little exercise is much safer than too much. Any indication of uneasiness or complaint of the jacket hurting are to be attended to, so that sores may not form on any point by friction; but such an incident is rare, if the jacket has been

well applied and projections guarded by cotton-wool in a rational manner. Space is too limited to allow us to mention all the little details that make for success. A whole chapter would not be too much to exhaust all the suggestions that might be usefully made. However, as most of them have probably been made before, and are scattered through the *Journals*, our object is accomplished in calling attention to them, and in recording our sense of their high value.

Rest having been obtained, and the hygienic and dietetic arrangements having been made as perfect as possible, can anything more be done for the patient? As a general rule, in ordinary cases uncomplicated with sinus or abscess nothing more is required, and the jacket precludes any local treatment.

When the disease, however, is complicated by abscess or sinuses we are brought face to face with other questions. A tendency to abscess or indolent sinuses that have very little discharge need not preclude the jacket treatment alone, provided a window is made opposite the diseased area by which the behaviour of the abscess can be watched or the sinuses dressed, and both may dry up and disappear under the influence of rest. But they do not *always* dry up and disappear, nor do they *often* do so, and herein lies the tremendous error that is so often made.

The abscess often only *apparently* subsides under rest, the improvement is most gratifying, and the danger of suppuration is lost sight of months after the child is said to have a relapse. An abscess appears elsewhere, or multiple abscesses show themselves, and these are ascribed by the friends to colds and various other causes, and not to the peregrinations of the old abscess or infections from the same source. If we look at many of our specimens, as illustrated in the previous plates, and if we peruse the brief history, it will be found that it was the abscess, the products of disease, that killed the patient. The disease was sometimes insignificant, in other cases practically cured, but the mischief had been done, and the patients died because the abscesses had not been looked after. Our practice is to allow the abscess an opportunity to dry up under rest, but should it be large and not diminishing, or small and growing larger in

spite of rest, then we open with the thermo-cautery, making a large wound and rarely using drainage. The opening with the thermo-cautery seals the tissues against the entrance of any poison to a new locality, the wound made by the thermo-cautery keeps open spontaneously for a much longer period than when made by the knife, and we often at the same time cauterise the skin over the diseased area with the gridiron arrangement of lines that we have already described in treating of tubercular disease of the joints of the limbs. We have dwelt so much upon the actual cautery in the place referred to, that we need not say anything about it here, except to remark that it is the only local application in the way of counter-irritation that we have found any distinct and decided benefit from. Iodine, fomentation, poultices, and blisters relieve pain sometimes, and we *think* do some good, but the benefits are not so patent to our senses that we can speak decidedly about them; but after the actual cautery has been applied, the disappearance of the granulation tissue is so marked as to be unmistakable.

Having opened the abscess with the thermo-cautery, we must receive the discharge on salicylic wool, or other absorbent and antiseptic dressing, and this dressing must be attended carefully to until the aperture closes spontaneously. With care in the earlier days of the treatment, the temperature never rises, but if the dressings are not changed sufficiently frequently at first, then septic changes may be produced and great danger ensue. The lost ground must be recovered by boracic syringings, but it is a difficult task. No one should open these spinal abscesses unless he knows he has time and opportunity to follow them up successfully, until they cease to discharge or have become insignificant sinuses.

Opening these abscesses with the aspirator is sometimes effectual after two or more aspirations, but this method generally leads at last to spontaneous or artificial opening. Its use is called for under certain circumstances, but we have not used it often for spinal abscess. We have opened spinal abscesses, cleared them out, and stitched up the opening immediately, and obtained union of the wound by the first intention. Weeks or

months after a fresh collection had formed, so that we think its advantages are, on the whole, more apparent than real, and do not excel aspiration, except that the procedure looks a bigger operation.

The scraping out of sinuses are attended with great danger of infection of the system, and we have been sorry that we operated in this way. The good done is problematical, the danger real and imminent. Iodoform solutions and emulsions have been largely used by several surgeons, and on the strength of their reports we have tried them, but we do not think the " game is worth the candle." The rapid cures are only apparent, and success has been claimed far far too soon.

Removal of the diseased vertebra is a method of treatment the most surgical of all, if it were always, or even often, practicable. We have tried it before we studied many of our specimens, but since this study the hopelessness of the task has been forced upon us by incontrovertible evidence, of which our illustrations form a part. In some cases the focus of disease is very small, even at the time of death, and in all cases it is very small at first. But in the former class of cases we would only come down generally on a carious spot of bone that we could not remove without injury to the delicate bone around, which injury would most likely perpetuate the caries. In the early stages of spinal disease, operation would hardly be entertained when rest and improved nutrition are so effectual, and the danger of the spread of tubercle by operation that must from their depth be inefficient, would be very great. We therefore think that, beyond the removal of a loose sequestrum, attempted removal of the diseased focus is too uncertain and temporary in its action to be relied upon as a method of cure.

When we open these abscesses with the thermo-cautery we always explore with a clean finger or probe to see if surgery can do anything, and if it can, we do whatever is necessary, but we have no faith in the deliberately planned operations for removing completely diseased vertebræ. It may be done in some few cases, but these only constitute the exception that proves the rule.

The spread of tubercle to the lungs, and more rarely to the peritoneum or brain, is an incident that spoils many of our otherwise most promising cases. Hence the terms "hospital ward" and "city life" indicate conditions inimical to the welfare of these little patients. Distinctly surgical treatment should be as short as possible, and the convalescent homes for these patients should be able to take care of sinuses, &c., else the benefits of the surgery may be more than neutralised by hospital life.

There are many methods of treating spinal disease we have not tried, and other methods we may not have tried fairly or fully, but the object of these papers is to give our own experience. A few years more of observation and work may revolutionise this experience, and we are quite prepared for, and earnestly desire, improved methods by which success may in all cases become assured.

Reviews.

THE CLINICAL USE OF PRISMS, AND THE DECENTERING OF
LENSES. By ERNEST MADDOX, M.D., *formerly Syme
Surgical Fellow, Edinburgh.* (*Bristol: John Wright
& Co.*)

THIS work is well and favourably known to most ophthalmic
surgeons; and in bringing out this enlarged and revised second
edition, the author meets a general desire for more precise in-
formation on the use of prisms in ophthalmic work than has
hitherto been available. It is a somewhat new as well as
difficult by-way of ophthalmic practice, and it remains to be
seen how far the use of prisms may be advantageous in the
class of cases referred to. In any case, the author is to be con-
gratulated on the production of a very useful and important
work, the practical chapters of which, especially on the Decenter-
ing of Lenses, the Study of Convergence, and the Use of Prisms
in Treatment, may be read with great advantage. It is
admitted that prisms are only demanded in a limited number
of cases. "*The great majority of latent deviations call for no
treatment at all.* Some cause trouble, and should be treated.
Constitutional treatment may suffice for some cases. If train-
ing is feasible, it may be tried. If training cannot be borne
without headaches or much discomfort, relieving prisms may be
ordered." . . . . . "Tenotomy, or advancement, should only
be resorted to in a small number of cases, where the deviation
causes undoubted trouble, and is too great to be relieved by
prisms." When surgeons generally realise how simple a process
tenotomy or even advancement really is, we are inclined to
think they will not altogether endorse this dictum. Most
people have an objection to wearing any kind of glasses; and if

this can be avoided by a simple tenotomy, and the eye be permanently readjusted, we think the operation is to be preferred, especially in the absence of any error of refraction otherwise necessitating the use of glasses.

DIPHTHERIA AND ITS TREATMENT.   By B. R. MARTIN, A.B., M.B. Dubl. Univ. (Pp. 32.) (*London : Ballière, Tindall & Cox.*)

THIS small book is written in support of the view that diphtheria is primarily local ; and further, that the disease may be cut short by repeated insufflations of sulphite of magnesium.

In support of this, Dr Martin states that for five years he has had no deaths and no sequelæ. He, however, gives no details of his cases, nor even their number ; consequently we can see no reason for changing our view that diphtheria is really a general disease, consequent on a local manifestation in the throat.

ON CHOREA.   By OCTAVIUS STURGES, M.D., F.R.C.P. (Pp. 181.) (*London : John Bale & Sons.*)

WE have read this book with much pleasure. Dr Sturges has represented the modern views of chorea with great skill, and in the main we agree with him.

We think, however, that chorea is best considered as a nutritional disease of the motor cortex, and we are inclined to reckon it as a manifestation of the rheumatic poison. We connot agree that the endocarditis met with in chorea differs in any respect from that occurring in typical cases of rheumatism : histologically the changes are identical. We are surprised to find that Dr Sturges considers the chorea of pregnancy to be of favourable prognosis : this is quite opposed to all other writers.

We can heartily recommend this work, which must for a long time be the " last word " on the subject.

A PRACTICAL TEXT-BOOK OF THE DISEASES OF WOMEN. By
ARTHUR N. H. LEWERS, M.D. (Lond.), M.R.C.P. (Lond.),
*Obstetric Physician to the London Hospital, &c. (London:
H. K. Lewis.* 1893.)

THIS little book, of about 430 pages, is a thoroughly reliable
and practical work, and one that can be safely recommended.
The instructions given are concise, the descriptions of disease
full enough to render their recognition fairly certain, and the
line of treatment laid down judicious and in accordance with the
best teaching of the day. As regards the rather large number
of illustrated cases given in detail, the author may probably
not agree with us, but in our opinion it is unnecessarily large,
and the details might have been considerably reduced without
in any way diminishing the value of the work.

Those immediately concerned in the publication have done
the parts allotted to them in a painstaking and workmanlike
manner. The book is well deserving of success, and we wish it
all it deserves.

A TEXT-BOOK OF THE DISEASES OF THE EAR. By Dr JOSEF
GRUBER, *Professor of Otology in the University of Vienna,
&c.* Translated from the second German edition and edited,
with Additions, by EDWARD LAW, M.D., and COLEMAN
JEWELL, M.B. (*London: H. K. Lewis.* 1893.)

DRS LAW and JEWELL are to be congratulated on having so
quickly brought out a second English edition of Professor
Gruber's *Text-Book of the Diseases of the Ear.* The first
edition was so favourably reviewed by both the English and the
American Medical Press, that we can now only endorse what
has previously been said. In the new edition the original
translation has been literally reproduced *in toto*, without any
alteration or curtailment in its classification, contents, or arrange-
ment. Much new matter and many references and annotations,
for which the editors are alone responsible, have been inserted

with the author's sanction. A specially interesting chapter is that relating to the treatment of Adenoïd Vegetations and Hypertrophy of the Tonsils—a subject only lightly touched upon in the first edition. Probably the most valuable addition is the chapter contributed by Dr Jewell on the Intra-Cranial Complications of Ear Disease, and is accompanied by Reports of Cases, Bibliography, Topography, and Statistics.

MANUAL OF THE DISEASES PECULIAR TO WOMEN. By JAMES OLIVER, M.D. (Edin.), F.R.S. (Edin), F.L.S., M.R.C.P. (Lond.), Fellow of the Obstetrical Society, &c. (*London : J. & A. Churchill.*)

WITHOUT wishing to say a word against Dr Oliver's Manual, we find it difficult to say anything in its favour. In our opinion it would have been better if, before publication, the author had submitted the MS. to some candid friend possessed of a fair knowledge of gynæcology. No doubt Dr Oliver is an excellent practitioner in his specialty, but excellent practitioners do not necessarily write excellent books.

SYPHILIS : ITS TREATMENT BY INTRA-MUSCULAR INJECTIONS OF SOLUBLE MERCURIAL SALTS. By EDWARD COTTERELL, F.R.C.S. (Eng.).

THIS little brochure treats of the value of intra-muscular injections of soluble mercurial salts in syphilitic affections. The author prefers the sozoiodol of mercury to other preparations of the drug. Of late years the treatment of syphilis by this method has been advocated by eminent authorities, each, as a rule, having a preference for his own particular form of the drug. The author points out that the advantage of treating syphilis by this method consists in the accurate knowledge of the quantity of mercury administered during the term of treatment,

and to the amount of secrecy it ensures. He also emphasises the relief it affords to the alimentary canal. He adds that if certain directions are carried out little or no pain results from the puncture. We cannot help remarking that slight as is the pain, a repetition of the puncture is dreaded by many individuals, and refusal to allow the introduction of the needle results. We have known this to occur in cases where the treatment was undoubtedly doing much good. The brochure is easily read, and we commend it as additional evidence of the value of intramuscular injections in syphilis.

A CONTRIBUTION TO THE PATHOLOGY OF THE VERMIFORM APPENDIX. By T. N. KELYNACK, M.D., *Pathologist to the Manchester Royal Infirmary, &c.* (*London: H. K. Lewis.*)

SEVERAL circumstances combine to make this book remarkable. We will briefly state what these are. Thus its size is considerable, while the subject of which it treats, if not inconsiderable, is at any rate very small, anatomically considered. The pages directly referring to the minute portion of human anatomy known now as the vermiform appendix are numbered up to 159, and are of large octavo size; but for the comfort of all intending readers, of whom we hope there may be many, it may be as well to state that the print is good, the type large, the margins wide, and that, though 159 pages are numbered, they are not all occupied by letterpress. No less than twenty-nine of these, or their equivalent in space, are blank, while a further space, equal to nine and three-quarter pages, is occupied by a number of very excellent illustrations. If the reader will make the necessary calculation from these data, he will find that there are about 120 pages actually treating of the appendix vermiformis. But any surprise that may be felt at this will be insignificant compared with the surprise at what immediately follows. This is the bibliography of the subject, which in the

preface the author modestly hopes may be considered "fairly complete." Perhaps the reader will think so too when he is informed that it occupies fifty closely-printed pages of small type, contains no less than 1321 distinct references to the writings of 1017 authors, and that these authors range from 1524 A.D. to the present day in point of time, and in point of space from the equator to as near to both poles as men can be found able or willing to write.

Turning now to the book itself, we find it divided into twenty-six chapters of more or less length and interest. Chapter I., of thirteen pages, contains a short account of the physiology of the appendix, and an interesting summary of the history of the literature of the subject, which, however, unlike the general run of works on history, begins with that of the future, then abruptly passes to the opposite extreme, and thence, by easy stages, comes down to our own time. The history of the future is embodied in a prophecy by Mr Treves, to the effect that, as the organ is "obsolete and out of date, it is safe to predict that in the intestine of the man of the future there will be no such structure found hanging from the cæcum." This prophecy might have been considered rash if the author had ventured to indicate the precise century in man's evolution when the curious anatomist should look in vain for a vermiform appendix; but, as Mr Treves and all his useful works will probably have been themselves obsolete and out of date many milleniads before that time arrives, his reputation is not likely either to gain or suffer by the result.

Chapter II. is devoted entirely to a consideration of the length of the appendix, and, as befits its subject, is short, not more than four pages being occupied in bringing home to the reader's mind the fact that it averages 3 inches, the variations being from zero to the single opposite extreme of 9 inches. The third entire chapter of three pages treats of the lumen of the body when there happens to be any, for in a certain small proportion of cases it is completely obliterated. "Peri-cæcal Peritoneal Fossæ" is the title of Chapter IV., which occupies ten pages, a large portion being, however, taken up by six engrav-

ings. The display of anatomical learning over this portion of
the subject, while very creditable to the author's industry, is
possibly a little thrown away, when it leads mainly to the
opinion, broadly stated in so many words, that the "fossæ are
undoubtedly exceedingly variable, and much difference of
opinion still exists as to their character and frequency of
occurrence." Some practical importance might possibly attach
to these pouches, for the author informs us that "in a number
of cases it"—the appendix—"has been known to become
herniated within certain of them;" but as these cases are not
related, we may, perhaps, presume that it was not much, if any,
the worse for the fact.

Chapter V. contains a highly interesting account, illustrated
by excellent illustrations, of abnormal positions of the appendix,
with a discussion of the various causes of such malformations.
Equally interesting is the account given in Chapter VI. of cases
of hernia of the appendix vermiformis and of internal obstruc-
tions caused by it. The histology of the organ, if it can be
correctly termed an organ, is discussed in the next chapter, and
the close resemblance in this respect to the tonsils, as pointed
out by many writers, insisted on; this resemblance extending
even to the liability "to recurrent inflammations, which naturally
subside after the twentieth or thirtieth year." We believe that
nobody has yet determined the use of the tonsils, while their
inconvenience is obvious enough to any one subject to recurring
attacks of quinsy; so that, reasoning after Mr Treves' method,
possibly some bold prophet may "find it safe to predict that
there will be no such structure as these also in the man of the
future." A short chapter of two pages is devoted to cystic
dilatation of the appendix, and a capital drawing is given of
the post-mortem appearances of a case which occurred in the
Manchester Royal Infirmary.

Of the abnormal contents of the appendix, which form the
subject of Chapter IX., the most numerous are fæcal concretions;
but such bodies as a grain of wheat, a small stone, a small bone,
a piece of a screw, orange pips, cherry stones, snipe shots, apple
pips, a human tooth, a pin, the bristle of a tooth-brush, &c., are

mentioned. The relative frequency of inflammation of the appendix and of the cæcum, and the varieties of inflammation of the appendix, occupy the next twelve chapters; and some extremely valuable clinical and post-mortem reports are included in them. The remaining five chapters are devoted to a consideration of the "Sequelæ of Appendicitis," "New Growths of the Vermiform Appendix," the "Signs and Symptoms of Appendicular Disease," the "Diagnosis of Appendicular Disease," and lastly, the "Treatment of Disease of the Appendix." These chapters are all of value, and will well repay the trouble of a careful perusal. We presume that Dr Kelynack is a young man, as his monograph, as he informs us, "was presented to the Victoria University as a dissertation for the degree of Doctor of Medicine;" and, being published in 1893, it is fair to presume that that honourable degree has only just been acquired. That the dissertation richly deserved the degree, nobody who reads it will for a moment doubt; and both the university which can stimulate to such thorough work and the candidate for its degree who can perform it are equally to be congratulated. If Dr Kelynack does everything as well as he has done this graduation thesis, the medical profession will be likely to be all the better for having him as one of its members.

ANÆSTHETICS AND THEIR ADMINISTRATION.   By F. W. HEWITT, M.A., M.D. (Cantab.).   (*London : Charles Griffin & Co.*)

THIS book repays one for extra care and attention in its reading.

The author, a distinguished specialist in this branch of medicine, has added much clinical information to our knowledge of anæsthetics, and has invented several admirable forms of apparatus, which are largely used and appreciated by anæsthetists.

We are glad to find that the notes and observations on

anæsthetics made by the late Dr C. E. Sheppard (formerly anæsthetist at Guy's Hospital, whose untimely death we all deplore) are incorporated in the text of the present volume.

The book is eminently practical in its character, and no space has been taken up with the purely historical part of the subject, nor the controversial matter concerning the early administrations of ether.

The author has wisely abstained from attempting to discuss the action of anæsthetics "from a purely experimental point of view," or "to harmonise clinical and physiological facts." He also significantly adds, "that a study of the numerous experiments made by various societies and commissions will reveal the fact that there are obvious differences between the chloroform phenomena witnessed by the physiologist, and those with which we are familiar in the operating theatre."

The various points mentioned throughout the book are further elucidated by illustrative cases drawn from the author's practice.

The more important anæsthetics are described, and the methods for ascertaining their purity are very carefully compiled.

The general condition of the patient is considered as regards sex, age, temperament, habits, physique, and disease. This is followed by an enumeration of the various surgical operations, together with the most suitable anæsthetic for each, the difficulties that may possibly be met with during the administration, and the best methods to be employed in dealing with them.

The greater part of the book, as may be expected, is devoted to the three great anæsthetics, viz., nitrous oxide, ether, and chloroform.

The apparatus invented by the author for the administration of nitrous oxide is figured and explained. It possesses the following advantages:—1. The patient breathes both air and gas through valves, which by their action indicate to the administrator the integrity of the respiration. 2. If the supply of gas happens to fall short, by a simple contrivance the valves can

be thrown out of gear, and to-and-fro breathing established. 3. The apparatus can be attached to Clover's ether inhaler, and the administration continued with that drug.

The subject of administering nitrous oxide with oxygen, originally proposed by Bert, is very fully discussed, and an ingenious apparatus, invented by the author, is illustrated and explained for administering these gases under ordinary atmospheric pressure, by means of which the asphyxial element is eliminated, and a longer period of anæsthetisation secured. There appears, however, to be some difficulty in regulating the right quantity of oxygen to be given with the nitrous oxide.

There is a very great tendency displayed to advocate the safety of ether as a general anæsthetic, and very strong reasons are introduced to substantiate this claim, some of which, on account of the great importance of the subject, we may summarise as follows:—

Tables are given, derived from different sources, showing the relative frequency with which chloroform and ether were used, and the relative death-rate. From these statistics ether appears to be more than five times as safe as chloroform.

" Ether produces a remarkably stimulant effect on the circulation and respiration. The circulation is not easily depressed by an overdose. Those accidental conditions which lower cardiac action under chloroform have a less influence on a patient under ether. The sitting posture is not liable to be attended by circulatory nor respiratory depression. The act of vomiting under ether is rarely accompanied by syncope. Deprivation of air is an advantage rather than a danger. Patients are not so susceptible to grave reflex circulatory depression as with chloroform. The respiration is so deep and audible under ether that the slightest departure in the direction of failure at once attracts attention. Owing to the greater strength of the respiratory movements, there is less objection to placing the patient in certain constrained positions. When ether is administered, even in toxic quantities, the administrator has usually ample time to resuscitate his patient. The workable area is greater with ether than with chloroform. We may err

on the side of too light or too deep a narcosis with ether with
no risk to the patient; but with chloroform this is apt to be
attended with difficulties. When toxic symptoms arise under
ether, the circulation is very slightly affected."

The author concludes by this important statement:—" What-
ever may be the precise sequence of events in death from an
overdose of chloroform, the clinical fact remains, and will always
remain, that the fatal phenomena are to all intents and purposes
cardiac. Failure to resuscitate the patient is due to the impossi-
bility of restoring cardiac action."

Whilst accepting these weighty and indisputable arguments
in favour of ether, together with the opinions of the most
eminent authorities, also quoted by the author, we very much
doubt if ether will ever entirely supplant chloroform. We are
inclined to the opinion of Snow, " that an occasional accident
should never stand in the way of ready applicability." That
chloroform is pleasant to the patient, and easy of administration,
will always be considerations; whereas, for the administration of
ether, a special apparatus is required, considerable skill and
practice in its use is necessary, and a great many patients are
very rebellious to its inhalation.

The various methods and phases in the administration of
these anæsthetic agents, either alone or in combination, are
very accurately explained, evidently the result of the author's
extensive experience; but, before leaving this subject, we would
like to notice a few points connected therewith.

The author has introduced a modification of Ormsby's inhaler
in the form of a hot-water chamber, by means of which the
frequent freezing of the sponge is obviated,—the only fault
possessed by this convenient inhaler.

The pupil is now recognised as an excellent guide to the state
of chloroform anæsthesia, and, after a considerable experience
with chloroform exclusively, we think that the author is not
quite correct in stating, " that a very small pupil means a light
anæsthesia." Indeed, we are so much impressed with the con-
trary, that we had almost laid down the axiom, that the smaller
the pupil the deeper the anæsthesia. There are in adults

exceptions to this rule, but in children exceptions are seldom met with.

In the section devoted to the mixtures of chloroform with ether, it is stated " that the Vienna mixture has been found to be uncertain and irregular in its action, and is now rarely used." We have used this mixture for several years with the greatest satisfaction, and we think that the addition of alcohol interferes greatly with the administration and utility of this compound.

In the chapter treating on the use of morphine in conjunction with general anæsthetics, we consider the author has overlooked the great advantage to be derived from the hypodermic administration of morphine previously to chloroform inhalation. In cases where chloroform has been administered, say fifteen or twenty times, at comparatively short intervals, the patient becomes accustomed to the drug, each successive administration becomes of longer duration, struggling is more frequent, and the anæsthesia is less complete. Now, if ¼ grain of morphine be administered by hypodermic injection fifteen minutes before the operation, a small quantity of chloroform is required, there is no struggling, and the subsequent anæsthesia is quite satisfactory.

The concluding chapters of the work are appropriated to the management and treatment of the difficulties, accidents, and dangers incidental to anæsthesia, and do not call for special comment.

With these very few critical remarks we predict that this work will indubitably be the standard work on the subject of anæsthetics.

The medical or dental practitioner can learn all that can be learnt, *from a book*, on this special subject ; but we must add what, curiously enough, has not been referred to by the author, that the information derived therefrom must be supplemented by experience, for we are strongly of opinion that experience forms an important factor in the administration of anæsthetics.

A TEXT-BOOK ON DOMESTIC ECONOMY ADAPTED FOR USE IN
TRAINING COLLEGES, SCHOOLS, AND NURSING INSTITU-
TIONS, AND AS A DOMESTIC BOOK OF HEALTH. By F. T.
PAUL, F.R.C.S., *Surgeon to the Liverpool Royal Infirmary,
Professor in Medical Jurisprudence, Victoria Univer-
sity, and Lecturer in Domestic Economy to the Edge
Hill Training College, Liverpool.* (*London : Longmans,
Green & Co.*)

THIS work contains a course of instruction well adapted for the
purposes intended. The information is exact and sufficient, and
so pleasantly conveyed, that it cannot fail to interest an intelli-
gent reader.

It is divided into two parts, separately bound, the first deal-
ing generally with matters which come under the head of
personal hygiene, the second with domestic sanitation, the cause
and prevention of disease, home nursing, and first aid in
emergencies.

A third of the first part is devoted to an account of the
structure and functions of the human body, and rather more
than a third to the consideration of the various kinds of food
and stimulants. The remaining chapters treat of personal
cleanliness, work and rest, exercise, recreation, and sleep. The
first half of Part II. gives adequate information on the require-
ments of a modern house—air, ventilation, heating, lighting,
water-supply, and the removal of waste matters. Then follow
a few short chapters on money, income and expenditure, and
thrift. The prevention of disease section includes some useful
notes on disinfectants and vaccination ; and the chapters on
home nursing include one on food for invalids.

Mr Paul's excellent text-book will be particularly welcome to
teachers. It is but bare justice to say that no elementary work
on domestic economy at present before the public can compare
with it. The author has had no easy task, and he has done
it well and thoroughly. The engravings illustrating the work,
many of them specially drawn, number 173, and admirably
illustrate the letterpress.

It is some proof of the care bestowed on this book by the author that we have only found one statement which appears to be incorrect. On page 381 is the following on notification of infectious disease:—"Fortunately now, the doctor attending, or whoever has charge of the patient, is required by law to at once notify the case to the medical officer of health, who has power to enforce whatever sanitary measures are necessary." This is true of Liverpool, where Mr Paul lectures; but inasmuch as the Infectious Disease (Notification) Act, 1889, is unfortunately an "adoptive" Act, there are still many districts, urban and rural, where no one is required by law to notify to the medical officer of health any case of infectious disease.

THE ART OF LIVING IN AUSTRALIA. By PHILIP E. MUSKETT, *late Surgeon to the Sydney Hospital, &c.* TOGETHER WITH 300 AUSTRALIAN COOKERY RECIPES. By Mrs WICKEN, *Lecturer on Cookery to the Technical College, Sydney.* (*London, Edinburgh, Glasgow, Melbourne, Sydney, and New York: Eyre & Spottiswoode.*)

THE object of this volume is succinctly explained by its title and dedication—it is dedicated "to the people of Australia, with one abiding hope for the development of all the great national food industries of our country." Mr Muskett desires to bring about an improvement in the food-habits at present in vogue. The people of Australia, we are told, live in direct opposition to their semi-tropical environment. In particular, the consumption of butcher's meat and of tea is enormously in excess of any common-sense requirements, and is paralleled nowhere else in the world. "On the other hand, there has been no real attempt to develop the deep-sea fisheries; market gardening is deplorably neglected; salads, which are easily within the daily reach of every home, are conspicuous by their absence; and Australian wine, which should be the national beverage of

every-day life, is at table almost a luxury." After years of attention to the subject, Mr Muskett is of opinion that the real development of Australia will not actually begin " till this wilful violation of her people's food-life ceases." Hence this book explaining the influence which food exercises on health, and advocating a minimum of meat and the widespread one of fish, vegetables, and salad. He adds that the every-day wine for Australian use is a wine of low alcoholic strength, and that Australians will not go far wrong if they " stick to their own natural wines." He regards as an anomaly the want of enterprise shown in starting deep-sea fisheries, considering the Australians come from a stock the most maritime in the world, and that healthy employment could thus be found for thousands. It is scarcely less remarkable that market gardening has not been taken up seriously. Round Sydney, Melbourne, Adelaide, and Brisbane something has been attempted, but beyond potatoes, cabbage, and tomatoes, little is grown. Then salad, which is so wholesome, and should be low priced and within the reach of the humblest, is neglected in the same incomprehensible way. As Mr Muskett is not a vegetarian, his remarks are not unduly biased. In many of the chapters is a good deal of what may perhaps be intended as ornate writing, and which is certainly superfluous. Occasionally, also, Mr Muskett is a little fantastical—thus ablution, bedroom ventilation, clothing, diet, and exercise are termed " the alphabetical pentagon of health." However, Mr Muskett has written for a purpose, and a very good purpose; he has arranged his evidence well and put his case very forcibly, and we wish him all success.

As for the considerable portion of the volume taken up with the practical side of the question, as exemplified by the Australian cookery recipes, Mrs Wicken has accomplished her task well. The recipes are strictly economical, and should assist in effecting the desired diet reform.

HERNIA: ITS PALLIATIVE AND RADICAL TREATMENT IN
ADULTS, CHILDREN, AND INFANTS. By THOMAS H.
MANLEY, A.M., M.D. (New York). (*London: F. J.
Rebman.*)

THIS work contains about 230 pages, and is divided into four
parts, embracing twenty-one chapters. The title-page and
dedication are dated 1893, but the preface is dated June
1892.

Part I. deals with general considerations and a chapter on
Congenital Hernia and Hygiene of Infancy. Under the latter
head the author expresses his objection to the binder ordinarily
applied round the infantile abdomen, and hints at the possibility
of hernia being thereby favoured, or at least its cure hindered.
He makes the following somewhat vague statement:—" A large
proportion of the ordinary variety of hernia of infants will dis-
appear by hygienic measures alone before the end of the first
year."

He objects to the use of trusses in herniated infants before
the walking period, but spends several pages in directions for
their employment in children on foot.

In another chapter he says:—" Surgical operations in simple
reducible herniæ of children are to be deprecated. With this
class they are seldom permanently curative, and when they
relapse are difficult to control with any sort of apparatus." It
is not unlikely that many surgeons in the world hold a similar
opinion, if they have not attempted such operations; but the
fact is, that many surgeons have proved the contrary opinion to
be true by the success they have met with in operating pro-
miscuously in childhood. Then he says:—" When an operation
for the radical cure of hernia is undertaken in a child, the opera-
tor must always have it distinctly understood that he is never
able to guarantee against a possible relapse, and that operative
interference is not wholly free from danger to life." No doubt
it would hardly be prudent to guarantee against a relapse, but
it is probable that of all periods of life infancy and childhood are
those in which the greatest proportion of successes is to be

attained, so much so, as that hardly any failures are to be expected. The experiences of this author would appear to have been hitherto not encouraging, but we can assure him that success may be met in this direction.

Part II. is devoted to hernia in the adult, and its palliative treatment, with directions for the use of trusses. Some of his attempts at pathological explanation are very crude, but it is unnecessary to specify them, as our object is not to pick holes in the work, but rather to agree with it where we can. At the same time, we may here draw attention to the insufficient revision of the work, indicated by misspelling of the names of Velpeau, Maclise, and others. The word "exomphalocele," too, is one that no one is obliged to use, but our author calls it "exomphocele" repeatedly.

Part III. gives a history of former operations for hernia derived, according to his own acknowledgment, largely from the work of M. Paul Segond. These operations were performed usually for strangulation, but also, and even in ancient times, for the purpose of radical cure. All kinds and varieties of hernia are alluded to, and certain historical references given.

Part IV. relates to modern operations for hernia, both strangulated and not. In the production of anæsthesia during strangulation he seems to entertain an objection to what he terms "pulmonary anæsthetics," such as chloroform and ether, which, he declares, add to the risks and mortality, and expresses a preference for cocaine locally administered by injection into the tissues. He gives an epitome of obsolete contrivances which have been devised for the purposes of radical cure, the methods by invagination, plugging the sac, and the various modifications of herniotomy.

Then follow detailed directions for the performance of herniotomy under various circumstances and in each situation. The work terminates with a table of fifty-eight cases operated on by the author.

In relating his experiences the author alludes somewhat pointedly to the mistakes of others, which he witnessed or was called upon to rectify. Some of these errors were committed

by house-surgeons acting in his absence according to his orders, to the best of their unaided ability. We could wish that the somewhat cheap, and at best but doubtful, glory thus assumed had been dispensed with by our author.

We have not attempted to epitomise the work before us, nor to make extensive quotations, but we are bound to say whether or no we consider the volume to be of use to readers. We cannot discern in it anything that calls for recommendation to others to procure the book. It is written in a rather rambling style, without any system that can serve to make it worth consulting. There is no index, so that a reader must already know the book before he can proceed to find anything in it. When he knows it, he will be bound to admit that he can hardly see why it was written, except as an appendage to the fifty-eight cases recorded at the end.

AIDS TO OTOLOGY. By W. R. H. STEWART, F.R.C.S.E., *Aural Surgeon to the Great Northern Central Hospital, &c., &c. (London: Ballière, Tindall & Cox.)*

THIS is the second edition, under another name, of the author's *Epitome of Diseases of the Ear.* It is revised and enlarged, and contains a considerable amount of information in a condensed form. Students and general practitioners will find it a useful and handy pocket-guide for the purpose of introduction to more voluminous works, and as such we think it can be recommended with confidence.

Other Reviews are held over for next Number on account of want of space.

TRANSACTIONS

LIVERPOOL MEDICAL INSTITUTION.

The Papers appear among the Original Articles.

ON GALL-STONES, MEDICALLY CONSIDERED.
By W. CARTER, M.D.

DURING the session 1892-3 of the Liverpool Medical Institution the subject of Gall-Stones was discussed. I was requested to contribute to that discussion from the medical side, Mr Banks leading on the surgical side. Through the unavoidable absence from England of the sub-editor, to whom the proceedings of the Medical Institution are sent, my contribution was received too late for publication, and I undertook to forward it as a paper for the next number.

To the surgeon the subject of gall-stones is very much simpler than to the physician, for usually when his (the surgeon's) services are required, the diagnosis has become so plain as to be beyond all doubt, and the question is narrowed down to the particular kind of operative procedure most likely to afford relief under the special circumstances of the case. Diagnosis is, however, by no means invariably a simple matter, as the following cases will show. Mr R., somewhat advanced in years, began to fail in health some months previous to the day of the meeting, and went to Harrogate in hopes of deriving benefit. While there he became jaundiced, and, as patients are so often apt to do, attributed the jaundice to the last mode of treatment—the mineral waters of that place. I saw him for the first time, with

two medical friends, shortly after his return. He was deeply jaundiced, but had never had pain or vomiting. Emaciation and weakness had been progressive. The liver was only very slightly enlarged, and that uniformly. There were no painful spots on palpating it. It was thought probable that the symptoms were caused by a tumour, small in size (for nothing could be felt) and malignant in character, in the head of the pancreas, which pressed on the hepatic or common duct. Some weeks later, when seen a second time, the symptoms were substantially the same, except that emaciation and weakness were more marked. He died after an illness of some months' duration, and the cause was shown to be a large gall-stone which had formed a pouch for itself beside the commencement of the duct, and by its pressure so completely occluded this as to prevent the escape of any bile into the duodenum. There was no other disease. The organs involved were exhibited.

In contrast to the above case are the two following. J. S., a sailor of middle age, was admitted to hospital with the following history. Exactly twelve months previously, while on a voyage in the Mediterranean, and while, as he believed, perfectly healthy, he had been suddenly seized with intense hepatic pain and violent sickness, followed quickly by jaundice. In a few days these symptoms passed away, but recurred in a fortnight, and since then the jaundice which had followed the second attack of pain and vomiting had remained permanent. He was much emaciated, had no pain, and simply felt very weak. The gall-bladder was enlarged and I had it aspirated, a pint of dark bile being withdrawn. No tumour except that caused by the gall-bladder could be felt. As no improvement followed the aspiration, it was decided after a time, and on consultation, to recommend to him to have the gall-bladder, which soon filled again after the aspiration, permanently drained. He survived the operation about twenty-four hours, and at post-mortem a small hard tumour, not larger than a hen's egg, was found in the head of the pancreas, effectually occluding by its pressure the common duct. There was no other growth, and there were no secondary deposits.

The third case was that of a powerfully built sailor, who was admitted to hospital in the middle of July 1893 (since the meeting at which the discussion was held). He had been ill, he said, exactly five weeks, and his illness commenced with violent pain and vomiting occurring immediately on his trying to raise the end of an iron beam, which it subsequently took the united efforts of five men to raise. He felt something give way, he said, and had never been well since. Jaundice quickly followed and had never disappeared. He ridiculed the idea of previous illness, saying that he never remembered having been ill in his life, and evidently priding himself on his great strength. He was very deeply jaundiced, and the liver was uniformly enlarged and tender. He had emaciated considerably. This tenderness was soon subdued. He steadily grew weaker, and died in the middle of August. Post-mortem—Extensive cancerous masses were found throughout the organs, the common duct being quite occluded by one of them.

In the first case, malignant disease was thought probable, while the cause of the symptoms was an impacted gall-stone. In the second it was thought that, most likely, and in the third that, not improbably, an impacted stone was the cause, while in each it was really a form of malignant growth. In the case of the first sailor it seemed to me certain that, whatever the cause of the jaundice, it could not be malignant disease of the liver itself, as, in my experience, life never lasts in that affection more than two or three months after the supervention of the symptom, though it may last a long time so long as jaundice is not present.

A fourth case might be very briefly mentioned. It is that of a man named Dixon, an omnibus-driver, who was several times admitted to the Royal Southern Hospital, the last time on December 5, 1879, suffering from bronchitis and ascites. He was not jaundiced. He died on December 16, and his gall-bladder contained 760 separate gall-stones, some, of course, of very small size, and a good deal of grit. These stones are in the museum of the School of Medicine.

Better far than any treatment for the removal of gall-stones,

either by medical or surgical means, is that which will prevent their formation, if that be possible. A few facts might be mentioned to serve as a basis for hygienic, dietetic, and medicinal recommendations. The bile is excreted under very low pressure. Active movements, therefore, and especially the movements of the abdominal walls caused by horse exercise, promote its free discharge; and in several cases where recurring attacks of jaundice caused much alarm, I have found that a daily brisk trot on horseback has been of great service in preventing them. The bile is very easily affected by chemical reagents, and especially by the least trace of acid. A single drop of a *very* diluted acid will at once cause inspissation, and the inspissated bile, if it could ever be thus produced during life, would be voided with pain and difficulty, or might form the nucleus of a stone. (This fact was demonstrated at the time.) Occasional courses of alkalies are therefore useful for those who show any evidence of a tendency to gall-stones. But as lime enters largely into the composition of the stone, all medicinal preparations, and as far as possible foods, containing this should be avoided, or at most only administered in moderate quantity. Inspissation of bile is also favoured by long retention of the secretion within the gall-bladder. It is useful, therefore, not to allow a long interval between meals, but to suggest that small quantities of food be taken somewhat frequently. Lastly, in this connection, I think that it is on the whole advisable for those subject to gall-stones to abstain entirely from alcohol.

But medicinal means are often useful in preventing the recurrence of attacks of jaundice associated with pain and vomiting, and I will mention a few of these from which, in my experience of cases, much benefit has accrued. Once every two or three weeks, a pill containing 2 grs. of pil. hydrargyri and 3 of pil. coloc. et hyoscyami gives a very satisfactory evacuation. The daily use for many months of 40 grains of phosphate of sodium half an hour before dinner serves, I believe, to liquefy the bile. The addition of from 7 to 10 grains of salicylate of sodium still further promotes liquefaction, and, as a rule, does no harm. I have recently been indebted to Dr T. B.

Grimsdale for drawing my attention to a remedy which I had overlooked, and which, shortly after my conversation with him, I was enabled to suggest with the most satisfactory results. In the case in question, attacks of jaundice with pain and vomiting occurred every few days, and rendered life quite burdensome. The medical gentleman in attendance had suggested all the means mentioned above, and had had them carried out without result. The attacks were becoming more frequent, and morphia had to be administered every few days. I urged, on the strength of the case which Dr Grimsdale had mentioned to me, the employment of the drug which he then alluded to, viz., the succinate of iron. A teaspoonful of a solution containing 5 grains was prescribed three times a day. Some weeks afterwards, on accidentally meeting the medical gentleman with whom I had seen the patient—a lady—I inquired how she was, and was informed that he believed she had been free from these attacks ever since she had commenced the medicine. Though no notice of the drug is given in many of the commonly used books on materia medica and therapeutics, I found references to it in that most useful repertory of medical knowledge, *Neale's Digest.*

If an attack is being actually suffered, the injection of morphia, or administration by the mouth of opium, is often absolutely necessary; but I have sometimes found that 20 or 30 minims of sulphuric ether not only remove the pain, but apparently prevent the attack from recurring so often as it did, while, of course, its use is less objectionable than that of morphia or opium.

December 21, 1893.

DISCUSSION ON TREATMENT OF EMPYEMA.

I SUPPOSE we are all agreed as to the necessity of evacuating purulent collections in the pleural cavity with as little delay as possible, and by the means which are found most useful in encouraging expansion of the lung and obliteration of the

abscess sac. We may differ as to the relative merits of aspira-
tion by this or that aspirator, or by Dr William Williams'
tube as compared with free incision; or when free incision is
employed, one may prefer an incision in one position, and
another in a different position. We may differ as to the
merits of primary excision of rib, either to admit of free
drainage, or to assist falling in of the chest-wall. I hope the
discussion will be directed to the consideration of these points,
and that some consideration will be given to the question of
dressing, irrigation of abscess-cavity, and other details, attention
to which are so powerful in promoting the rapid healing of
the abscess-cavity.

Before dealing with these different details of treatment, I
would like briefly to mention some points which have attracted
my attention in looking over the notes of cases under my care
at the Children's Infirmary. I have had a large experience of
empyema during the twelve years I have been connected with
that institution, but my statistics will apply to the cases only
which have been under my care since 1887. I have had
during these seven years about 60 cases of empyema. I have
eliminated 5 cases which were admitted after the empyema had
been opened and treated in private or at other institutions, or
had discharged by natural process. Of the remaining 55, 11
have died, 44 have been cured. Of the deaths 9 were in
children 2 years or under, and were due to the existence of
complications such as catarrhal pneumonia, pericarditis, chronic
diarrhœa. Of the remaining two, one, a girl of 6 years, suffered
from advanced phthisis; the other, a boy of 4 years, suffered
from septicæmia. Of the 44 cases of cure, 14 were under 3
years of age, 18 under 5 years, 7 under 7 years, 5 under 12
years. Among the 55 cases (32 boys, 23 girls), empyema of
the left side has been nearly twice as frequent as empyema of
the right. I have had two cases of double empyema, one com-
plicated with pneumonia, the other with pneumonia and peri-
carditis, both of which died.

I should have liked to have found out from my notes of the
44 cases I have described as cures how long a time on an

average elapsed between the opening of the empyema and the complete healing of the wound, but the time at my disposal has not permitted me to do so. I have, however, noted this point in all the cases which have been under my care during this and last year. They are 16 in number. They have been treated by tapping by Williams' method, or by free incision, or both methods combined. Two were successfully treated by Williams' tube alone. Four were treated at first with the same tube, but it was afterwards discontinued, and an ordinary drainage-tube with an antiseptic dressing applied. The remaining 10 were treated by incision from the first, with ordinary drainage-tube and dressing. With the exception of one case treated first by Williams' tube, which became septic and was discontinued, and in which a small sinus remained unhealed for five months, the average time taken between tapping or incision of the empyema and the healing of the wound, with obliteration of the abscess-sac, has been four and a half weeks. The extremes were one week and ten weeks.

Coming now to the question of the treatment which we usually adopt at the Infirmary for Children when, from consideration of the history of a case and the signs in the chest, a pleural effusion is suspected, an exploration is made with a hypodermic needle, without an anæsthetic, or with the aid of the chloride of ethyl spray to freeze the skin at the point of exploration. I generally use such a hypodermic needle as I show you, with a large bore, through which pus is sure to flow if it be present. I choose the position of greatest dulness on percussion, and preferably a point where there is sufficient room to afterwards insert a drainage-tube. Sometimes this is a little below and external to the inferior angle of the scapula, sometimes in the mid-axillary line, and generally in the seventh intercostal space. If pus be found, our most common proceeding is to make a simple incision over the point of exploration through the skin, thrust in a director along which the pus will ooze out, then follow the director with a pair of dressing-forceps, which are afterwards opened out and the incision well enlarged. As much pus and

lymph as will come are allowed to flow out, the hand holding
the dressing-forceps being covered by a moist towel to prevent
the discharge being spluttered over the operator.   A rubber
drainage-tube, as large as can be inserted, is then put in, and a
safety-pin attached to it to prevent its slipping further into the
cavity.   Iodoform is dusted over the wound, and a thin moist
fold of perchloride-gauze put over the wound, round the tube,
and between the safety-pin and the skin.   A ring-pad is then
applied round the opening, made of perchloride-wood-wool, to
prevent the dressing being too tightly pressed against the
mouth of the tube, so as to block it.   Over this more wood-wool
dressing is applied, and over all a piece of jacconne to maintain
a certain amount of moisture, as I have found a completely dry
dressing will not absorb the discharge so readily, or will allow
of drying and caking of the discharge round the wound with
blocking up of further discharge.   A muslin or flannel bandage
is carried firmly over the margins of the dressing, and lightly
over the site of the wound.

As a rule, the dressing is renewed every day, at first, the
tube taken out, washed, and re-inserted.   No irrigation or
syringing is employed unless the discharge is or becomes foul,
when some boracic lotion or sanitas lotion is used.   As the
discharge lessens, a smaller rubber drainage-tube is substituted.
If a sinus is slow in healing, a little weak iodine lotion may be
injected, or the sinus is gently scraped with a spoon.

As regards other methods, I have had two cases, so far as I
can remember, of localised empyema which have been cured by
a single aspiration; but in all the others, in which aspiration
has been tried, the aspiration has had to be repeated, and
finally an incision resorted to, so I have almost entirely dis-
continued the use of the aspirator.

The last two cases I have had of empyema, I have evacuated
as much pus as would come readily with Dieulafoy's aspirator.
I think it is desirable in using it not to continue aspirating
till blood-stained pus appears.   The walls of a pleural abscess
bleed readily if much disturbed, and this bleeding is prejudicial
to rapid healing.

Williams' tube I have used a good many times in the last eighteen months, but have almost discontinued it, as it does not drain the cavity quickly, often gets blocked up with lymph, or the tube gets turned inside the chest, or slips out and lies on the surface of the skin. I find also that it is much more difficult to keep the wound sweet with it than with the incision and antiseptic dressing. Altogether with this plan one works too much in the dark, and has to take too much on faith.

As I have had two cases in which a single aspiration cured, and another in which Williams' tube resulted in a cure after a few days, I believe that sometimes, if the bulk of the pus be removed from a cavity, the rest may afterwards become absorbed, and the patient require no further treatment. This, however, I am sorry to say, only occurs in a very few cases, too few to influence one's general practice.

In a fair number of my cases a small piece of rib has been excised for the purpose of gaining a larger opening for the insertion of the drainage-tube, but I have now discontinued this practice, as I think it is unnecessary, and increases the gravity of the operation by incision. One case in which this was done afterwards got septicæmia, probably by scarlatinal or diphtheritic infection, and died. Since then I have not found it necessary to continue this operation, and I believe my cases have made as rapid, if not more rapid, recovery without it. I should not, however, hesitate to have it done if proper free drainage could not be obtained without excision of rib.

It is seldom, in children, excision of rib is necessary to assist the complete obliteration of the abscess sac. The chest-walls are so pliable that they don't require to be made more so.

I have had one or two cases in which my colleague Mr Murray has performed this operation for me, but they have, if I recollect, been cases in which the empyema had burst externally before admission, or, at least, in which the incision of the empyema had been performed elsewhere. This is a point on which others may have more experience.

As to ultimate results as regards expansion of the lung and deformity of the chest, so far as children are concerned, they are

very satisfactory. It is only in cases in which the empyema has existed for some months before treatment is undertaken, and the lung is permanently bound down and cirrhosed, that much deformity of the chest results. As a rule, it is very difficult to discover any measurable difference in circumference or expansion of the two sides.

Some years ago I showed at a meeting of the British Medical Association, when it last met in Liverpool, half a dozen cases of cured empyema, none of which, so far as I remember, had been cured for more than a year; and by placing sticking-plaster over the wound and over a corresponding spot on the healthy side, I was able to puzzle numbers of gentlemen as to which was the side that had been affected.

Mr W. THELWALL THOMAS, F.R.C.S.—Pus in the pleural cavity must be dealt with in exactly the same manner as pus anywhere else.

The different and many half-hearted attacks made on it are no doubt due to fear of the thoracic cavity.

The danger *often* lies in these *small* incisions and puncture drainage.

Abscess elsewhere is generally divided into acute and chronic, and the same classification is particularly applicable to empyema.

I. *In the acute form*, after a week or two's illness from acute pleurisy, the temperature runs up, occasionally rigors are present, and in a few days œdema may occur over some of the intercostal spaces.

Such is the history of acute abscess, and very few of these cases are overlooked.

II. *In chronic empyema*, after a variable period of indefinite illness, occasionally directing attention to the chest, often, however, not doing so; slight difficulty of breathing, *no œdema* and *no fever*. The chest may be found to be slowly filling with fluid, which, on introducing an exploratory needle, proves (often much to the astonishment of the attendant) to be pus.

These cases are often overlooked for months; in one case, E. B., for *eighteen months*.

Valuable time is often lost in these cases waiting for œdema and temperature, which hardly ever occur in chronic empyema. The absorption of fluid (serous) by the pleura *may* occur to a large extent, as we all know; but after the chest has persisted dull for some weeks, certainly no harm is associated with hypodermic exploration. Such, and such alone, will diagnose pus for us in these cases.

The treatment of these two classes of cases must be carried out as such conditions are elsewhere,—*free drainage persistently and thoroughly carried out.*

The pus in empyema, following as it does inflammation of a serous membrane, is mixed with *large flakes of lymph*, which must either be *brought away, split up*, or *organised.* The *first is the easiest and safest.* For the other two processes to occur, *perfect asepsis is necessary.* Alas! how often have we seen it fail.

If the case, after simple and small incision (the size of a small tube) becomes septic, which it often does in about three or four days, up goes the temperature, the discharge becomes fœtid, and then commences "*washing out.*"

Washing out, as a routine practice, is a confession of failure. Fœtor spells failure of drainage.

Free drainage, even after decomposition, is speedily followed by absence of smell and diminution of discharge (cases H. C. and E. B.).

If a patient needs turning over, in the after-treatment, to empty the chest, that in itself condemns the position of the opening.

Openings are too often made too near the nipple. Washing out is associated with danger, particularly as commonly practised, by inserting the nozzle of a Higginson, then forcibly filling the cavity, the fluid needing coughs and splutters to expel it again. I *once witnessed* a death where the patient (a boy æt. 14) fell back dead in bed during irrigation. If irrigation is resorted to, two tubes ought to be in the chest, or two holes, so that lotion

injected through one hole can escape readily through a larger; so that no intra-thoracic pressure be possible. This is a principle very firmly insisted upon by Macewen in cerebral abscess.

In *acute empyemata* of a few weeks' duration in a child, any simple method of opening the chest suffices, provided all lymph escapes and a tube is inserted, be it indiarubber, vulcanite, or silver, it matters little (case E. B., tube removed in five weeks).

In adults, free drainage can *best* be obtained by removal of some portion of rib, so that there be no anxiety from fear of pressure on the tube by the collapsing chest-wall. Following this method in two cases, the tube was removed in (1) seven days (P. C.), (2) three weeks (F. B.), and the patients are perfectly healthy to-day.

We have seen cases whose temperature was only slightly elevated at the time of operation by *simple* incision, become alarmingly high in three or four days, and demand more thorough drainage. This is entirely avoided by removal of bone.

Against removal of bone will be urged " the length of time it takes to perform." *It takes two or at most three minutes*, carried out thus:—8th rib, near angle of scapula, is chosen. A sharp knife is stabbed down to rib, and an incision 3 inches long made along it, keeping firmly on bone all the way. Clamp vessels in subcutaneous tissue; periosteal elevator quickly peels lower portion of periosteum out of subcostal groove (it is not necessary to entirely peel the rib). The bone is cut through at each end of the incision, dragged out by sequestrum forceps, when the intercostal vessels are seen crossing thickened tissue in a curved direction. Clamp each end. Open pleura.

If there is a large quantity of pus, a small opening is made at first, to prevent too sudden escape and too sudden tumbling of the heart into its normal position.

The incision through pleura should easily admit two fingers in child, three in adult.

If the pleura be thick, a piece ought to be cut away. Vessels

which are clamped are now tied. It is possible to avoid interfering with the vessels, but subsequent ulceration into them may take place, so that I always tie them.

The cavity is mildly irrigated with very weak carbolic or boracic lotion. A tube with a flange, never longer than $2\frac{1}{2}$ inches, passed in. (Long tubes can serve no useful purpose, they only irritate lung. I have never understood why they are used.) The operation is often more quickly done than this description takes to read.

For anæsthetic, a little $CHCl_3$. Keep the patient flat, with the side of the chest over the edge of the table, or on a raised framework of wood in an irrigation-trough.

Turning patients over on the sound side sometimes alarmingly increases respiratory symptoms as soon as the chest is opened.

Dressings.—Cyanide gauze—wood-wool pads.

CASE I.—F. D., 15, from "Akbar" training ship, sent by Dr Spratley, March 21, 1893. Portion of one rib removed. Tube discarded in three weeks. He is at present, in the words of Dr Spratley, December 19, 1893, "quite well."

CASE II.—P. C., æt. 7, from 10 ward, July 27, 1893. Dr Bradshaw's case. (Incision; ribs close together at point of incision.) 1 inch removed of one rib. Tube removed on seventh day, December 19, 1893.

CASE III.—E. B., æt. 7. Case of Dr Glynn. Child seriously hampered in breathing. July 7, 1893, free incision only. Pleura opened for $1\frac{1}{2}$ inch; all lymph washed out. Silver tracheotomy-tube; tube removed August 15 (five weeks after).

—December 19, 1893.—"Child keeping very well; full of good spirits."—Mother's letter.

These are acute cases.

Chronic Empyema.

(1) Simple, and (2) those cases which have already been treated by insufficient opening, and the patient rapidly going downhill through suppuration and hectic.

Here portions of more than one rib must be removed.

This is more quickly carried out by a flap incision. The flap includes three sides of a square, the base (the fourth side) being towards the sternum, so that it falls naturally by gravity into position. This includes all tissues down to ribs, the periosteum being often scored in peeling the flap.

Vessels clamped. Each rib is bared, as in the simpler procedure, then cracked through and torn away. The intercostal vessels can now be seen crossing what remains in a series of curves; these are clamped *at each end;* the thickened pleura (as Case E. B., as thick as "shoe leather") cut away; cavity cleaned; flap sutured in position, having the posterior edge only held at each end, the gap being the drainage-hole.

Three Cases.—H. C., æt. 14. Dr E. T. Davies' case. R. chest previously opened by removal of small portion of one rib; drainage found to be insufficient. When admitted he was in an extremely emaciated state; at times quite maniacal; rapid, feeble pulse; continually moaning. He had a bedsore over the sacrum. Discharge from chest fœtid. The patient was apparently rapidly sinking.

February 18.—Flap operation; 3 inches of 3 ribs rapidly removed. This appeared to be his only chance. The flap sloughed, leaving a large hole for drainage, which did not require a tube. He rapidly gained flesh, became "himself again," and in *three months* had completely healed, and was at work as an apprentice to the plumbing. (*Shown to-night.*)

CASE II.—W. T., 22. Empyema opened, L. side, November 11, 1892, by Dr Shaw. The discharge became fœtid; in three months commenced to expectorate pus.

March 21, 1893.—Operation—Mr Banks. Some portion of one rib removed.

May 4.—Tube came out, and could not be replaced.

May 5.—At Mr Banks' request, owing to his inability to attend, flap operation 3″ of two ribs removed near left of scapula, working backwards from original drain incision.

June 16.—Discharged, less than six weeks after operation. He came back with a small subcutaneous sinus,

which soon healed. In August he was working. (Shown to-night.)

Last case is the most interesting.

E. B., 19.—June '90—"Inflammation of lungs."

February '91.—Swelling in left side of chest, and some difficulty of breathing. Under medical treatment for over twelve months. This swelling increased, and was not diagnosed. The swelling was so large that new growth of the lung was suspected. The spleen *appeared in the iliac fossa!* slightly enlarged; and she was sent to the Hospital for Women, Shaw Street, for tumour of the spleen! Immediately transferred to Royal, under Dr Glynn; operation decided upon.

Chest.—Left side bulging; no movement; dull all over; full of fluid. Spleen pushed down by dull area into iliac fossa.

Heart.—Apex pulsating $1\frac{1}{4}$ to inner side of *right nipple.*

September 21.—Decided to go to work cautiously; tried *syphon drainage* of Dr W. Williams; on the fourth day, owing to blocking by lymph, her temperature, *normal before operation,* rapidly rose. She had rigors.

Metal tracheotomy-tube used.

Heart returned to near its right place.

Then there being no signs of enlarging lung,

October 22.—2 inches of one rib removed.

She improved wonderfully, increased in weight; still very little diminution of cavity. So on

December 10.—Flap operation: 6 inches of six ribs removed, Nos. 4, 5, 6, 7, 8, and 9, together with the thickened pleura, which was nearly $\frac{1}{4}$ inch thick.

Although ample provision was left for drainage, the hole was so large that no tube was placed in it; at the first dressing after operation three days afterwards, the flap had united all along the line; the tumbling in of the flap had allowed this, so that a pair of dressing-forceps had to be passed in.

Went home on January 24, 1893.

Returned to us again. The side had fallen in very much, and there was a difficulty of drainage; so we made another hole more posterior still.

The discharge now is about 2 oz. a day.

I fear no more can be done, and we must rest content—sympathising with the patient that her condition was allowed to go on for so long undiagnosed.

Here are six cases of empyema, the *only ones* treated. Five were cured in very little time. As to the sixth—well, it speaks for itself.

My argument—supported, I take it, by actual results—is for free incision near the angle of scapula, removal of rib or ribs, and not trusting to washing out, based upon two axioms—

(1) Fœtor during after-treatment : means bad drainage.
(2) Washing out as after-treatment is a confession of failure; often the result of opening too anteriorly.

Dr BRADSHAW said that, as a rule, an empyema could not be distinguished from a serous pleural effusion until some of the fluid was withdrawn by aspiration. His usual practice on finding pus under these circumstances was to withdraw as much of it as could be got to flow through the aspirator, and to wait a few days for it to collect again before resorting to a free incision. He believed that a preliminary aspiration was desirable, for the following reasons :—It generally gave immediate relief to pyrexia and dyspnœa, and could be performed at once, the needle being already in position, without having to wait to administer an anæsthetic. Further, he believed that the aspiration favoured expansion of the lung, and might allow of its becoming, to some extent, fixed by adhesions in a position of expansion; and that, at any rate, it gave time to get the patient in a better condition for the administration of the anæsthetic and for undergoing the operation. It was necessary, before resorting to a free incision, to allow time for the pus to re-collect, otherwise none might be found when the chest was opened. It was also essential to explore the chest with the aspirator when the patient was under the anæsthetic before making the incision, otherwise the operator might miss the abscess-cavity. As regards the kind of opening to be made in

the chest, Dr Bradshaw was in favour of a double opening—one made where the matter was most accessible, the other behind and below.

Dr CARTER said :—Mr President,—The moral which I should derive from the discussion thus far, if it had not been the moral forced upon me by experience, is, that no exclusive method of treatment is right.   Not only is there a great difference between children and adults, but between adults themselves, quite irrespective of chronicity or acuteness of the case.   In the case of children, opening and free drainage will almost always prove effectual, and the chest will expand.   Coming to adults, where the elasticity of the chest-wall may be impaired by ossification of the cartilages, and perhaps from the thickening of *old* pleuritic adhesions from previous attacks, various methods must be adopted, according to circumstances.   In the library are two men, both of them at or beyond middle life.   In one (Johnson) Williams' tube was used, with the most satisfactory results.   The man, though the operation was carried out but a few weeks ago—and he is but a single illustration of many such cases—is now very strong and stout, and is driving his cab. Incidentally, I may mention that non-tubercular empyematous cases always get fat after being tapped.   The second case, a man named Ackerly, a waiter, following his employment without any inconvenience, was admitted in March 1891.   In this case, a man beyond middle life, it was found impossible to bring adhesion of the pleura about, and portions of six ribs were removed.   Free drainage followed, and the man was soon well, and has remained so ever since.   Such cases as these are the cases where removal of portions of ribs is necessary ; but I can hardly think such a proceeding can be necessary in children, or if so, the cases must be extremely exceptional.   Two points are especially worthy of notice, viz., that a local anæsthetic (such as ice and salt) shall be applied before the trocar is introduced.   This tends to ward off shock.   The second point is to administer a dose of brandy, which also tends to the same beneficial result.   Dr Carter, as the result, he thought, of the

uniform adoption of these precautions, did not remember a single case of death at the time of the operation, and as its direct result. Another point, which he had learned from Dr Macalister and found extremely useful, was, that neither carbolic acid nor any other fluid capable of coagulating albumen should be used for antisepticising small tubes. If these are employed occasionally no pus will flow, though it may be present in large quantity. It is an actual experience of a difficulty of a serious character through not recognising this principle, that gives it real importance.

Dr MACALISTER remarked that, having seen many cases of empyema treated with perfect success, both as regards the immediate and the remote results of the operation, by simple incision and drainage, he failed to see the advantage or necessity of removing any portion of rib. The only cases in which the resection of rib had been called for were these—chronic empyemata—in which the lung had remained unexpanded, and the chest-wall had been unable to adapt itself. Regarding irrigation, it had proved of service in some cases where a bronchial fistula had existed, and where the pus had become very fœtid; but in other cases it was, as a rule, unnecessary, and indeed had proved dangerous in a case in which he was washing out the chest with a weak solution of iodine, when the child took convulsions, and it was only after keeping it under the influence of chloroform for several hours that the convulsive tendency ceased and recovery took place. He cited other cases, mentioned by Dr Caley, in which convulsions and death had followed injection of the thoracic cavity for the treatment of this disease.

Mr PAUL said that, as there were so many speakers, he would confine his remarks to one branch of the subject, namely, the best method of operating in cases of empyema. The proceeding he generally adopted was as follows:—Having decided upon the probable area of the empyema, he proceeded to make two openings into the cavity, the first being higher and anterior to the second. Each opening was made by dividing the skin and muscles with

a scalpel, and then thrusting a pair of dressing-forceps through the intercostal space, and opening them, according to Hilton's method of opening deep abscesses of the neck. A long bent probe was introduced through the first opening, in order that the cavity might be explored, and the best position for the lower opening be determined upon. The latter was then made. The next thing to do was to pass a large rubber drainage-tube through both openings, and the way to do it was to attach the tube firmly to a piece of stout silk threaded through the eye of a silver probe, then pass the probe into the upper wound, and grasp it with dressing-forceps introduced through the lower wound, and so draw it out of the latter. The silk, of course, followed the probe, and the drainage-tube the silk. Now, he did not at all agree with the speakers who were opposed to flushing out the cavity of an empyema. As a matter of fact, they probably had no experience of thoroughly washing out such a cavity, as it could not be done with ordinary drainage-tubes. Since he had adopted a certain slight modification in the drainage-tube, his success in the treatment of empyema had been almost constant. The modification seemed slight, but in effect it was very great. It consisted in using a large, stout, rubber tube, ligatured in the middle, and with holes cut above and below the ligature. In the case of the ordinary single tube, fluid was pumped in, causing undue pressure, and then allowed to flow out again if the opening also was single; if the latter was double, the fluid went mostly straight through the tube. In neither case was the pus at the bottom of the cavity stirred up and removed. The effect of the modification of the tube described was that every drop of fluid introduced passed out of the tube, circulated through the chest, and then was discharged from the opposite end of the tube. With the old tube you might wash for an hour, causing the patient a lot of distress, and not get the chest clear; by this method a pint of fluid was often sufficient to produce the desired effect, and without causing the patient to suffer any discomfort, far less any danger from pressure or other condition. He was not prepared to say that flushing was necessary or advisable for all

cases of empyema, but he thought it should certainly be done in those which were septic, and in which the lung was bound down, and could not readily rise to the surface again. He was not specially opposed to removing a piece of rib for drainage purposes, but he thought the method he had described was more effectual, and had the advantage of not interfering with the ribs. In certain chronic cases, no doubt, it was quite necessary to remove considerable portions of several ribs; and all surgeons, even although they might be opposed, as he was, to the routine practice of primary excision of rib for drainage, would admit the value of this proceeding in such cases. Still, proper drainage would cure many chronic cases, and one of these extensive operations was not to be justified simply by the fact that the case was chronic. About a year ago a chronic case was transferred by the President to him for treatment at the Royal Infirmary. She had been "discharging" from her opening in the chest for a long time, but not draining. Proper drainage made a complete cure of her without cutting a rib, and in less than three months.

Medical Cases.

November 9, 1893.

MR CHARLES G. LEE read the following note on the use of Fluorescein in affections of the cornea; and remarked that Fluorescein, resorcin phthalein, having the formula $C_{20}H_{12}O_5$, was one of the complicated higher carbon compounds, is formed by heating together resorcin and phthalic anhydride, and may be taken as a coal-tar derivative, coming from phenol.

This above brief allusion to the chemistry of fluorescein Mr Lee thought might be of service, as he had been at some pains to identify it, and had, as a result, discovered that its affinity to fluorin was phonetic, not chemical.

The medical history of fluorescein was brief and modern; its value as a medicinal dye appears to have been discovered by Drs Fromm and Grovennon, assistants in the Eye Clinic at Breslau. These gentlemen have reported the results of their experiments in the *Archives fur Augenheickund* in 1890. The only references in English medical literature are to be found in the *Lancet* for February 5, 1891, and in the *British Medical Journal* for September 12 of the same year,—the last being the substance of a paper read by Dr Adolf Bronnel at the Bournemouth Meeting of the Association.

Both these accounts substantially agree in their description of the qualities and uses of the substance, and may be thus summarised.

Fluorescein is chiefly of value as an aid to diagnosis, and is dependent upon the fact that it stains any portions of the cornea that may be denuded of their epithelium of a diffuse green colour; any leucocytes or free cells that may be adjacent to the ulcer are similarly stained, while the healthy corneal tissue is left unaffected by the dye. Abrasions of the conjunctiva are stained of a bright yellow: the alteration of colour will remain for some hours.

In applying fluorescein to the cornea, it is sufficient to take two or three drops of a two per cent. alkaline solution, and place it on the surface of the cornea, then direct the patient to keep the eyelids closed for a few minutes: on inspection it will be seen that any ulceration is mapped out in an emerald green pigmentation: this often extends beyond the limits we had supposed marked the boundary of the ulcer, thus clearly indicating the more extensive area over which the cautery or scoop must pass if our object be to thoroughly extirpate the microbes.

Another advantage obtained by employing this dye is, that it leaves unaffected all spots on the cornea where the epithelium is intact, so old leucomata are unaffected; and similarly when the epithelium has been restored over recent ulcers, we may, with greater confidence, assure our patients of the completion of their cure.

Illustrative of the above remarks, a boy suffering from

sloughing ulcers of the cornea was shown and the green pig-
mentation of the ulcers, as well as of their infiltrated circum-
ference, was readily seen, after the fluorescein had been applied.

An Invalid's Dietary. By W. CARTER, M.D., LL.B.

As an example of the popular error that prevailed with regard
to food and its relation to bodily strength. Dr Carter read a
list of the food and drink actually consumed by a patient who
consulted him in October 1892, and who complained that, not-
withstanding all the nourishing food which she took, she seemed
to grow weaker instead of stronger. The list was drawn up by
the patient's daughter, and represented the quantity taken on
October 7, 1892. It is given exactly as written down, with
remarks by the daughter as to weight, action of bowels, &c.
The patient was about 4 feet 10 inches high, looked the picture
of robust health, and appeared to be entirely free from disease
of any kind, though the object of very great anxiety to her
husband and daughter, owing to her feeling of prostration. The
opinion was expressed that the gradual diminution of her food
and drink to about a third or a fourth of its amount would be
followed by complete restoration of strength. Dietary for one
day. Happily her eliminating organs were sound, so that up
to the time of consultation she had not been actually poisoned
by excess of nutriment.

7 A.M.—Breakfast—breakfast-cupful of cocoa, one light boiled
egg, one very thin slice of bread and butter.

8.30 A.M.—About a wine-glassful of bovril.

9.30 A.M.—Six oysters, one small cup of tea, half slice of thin
bread and butter, small piece of cold chicken, half-pint of beer,
and half slice of thin bread and butter.

11.35 A.M.—About a breakfast-cupful of boiled milk, poured
over half a thick slice of bread.

1 P.M.—Dinner—about 3 oz. of fried mutton, a slice of thin
bread, half-pint of beer.

3 P.M.—A breakfast-cupful of boiled milk, poured over half a
thick slice of bread.

4 P.M.—About 3 oz. of fried fish, half a slice of thin bread and butter, half a pint of beer.

5.25 P.M.—Small tea-cupful of tea, half slice of thin bread with butter and jam.

6.45 P.M.—Cold chicken, half slice of thin bread and butter, half a pint of beer.

8.40 P.M.—Cup of boiled milk, poured over half a thick slice of bread.

10 P.M.—Supper—3 oz. of fried fish, a thin slice of bread, half a pint of beer.

2.30 A.M.—A large breakfast-cupful of boiled milk, poured over a slice of thin toast.

5.30 A.M. and 6.40 A.M.—The same amount as at 2.30 each time.

Mrs ——— seems to have the greatest desire for food between the hours of 5 A.M. and 9 A.M.

Bowels moved, 6 A.M., October 7.
      Do.   5.35 A.M., October 8.
Urine passed, 6 A.M., 9 A.M., 1.40 P.M., 3 P.M., 6.40 P.M., 10.30 P.M., 2.30 A.M., 5.35 A.M.

Mrs ——— was 11 stones 2 or 3 lbs. eight years ago, and is now 12 stones 13 lbs.

Mrs ——— was growing stout before she had influenza, and I think she would be nearly 12 stones then.

DR CARTER showed a child 18 months old, who for twelve months had been the subject of extraordinary movements of the abdominal walls and viscera. These movements were regular, rhythmical, and large, so as to be plainly visible across a room. They occurred about fifty times a minute, night as well as day, were quite painless, and did not appear to disturb either the health or appetite. The bowels acted quite regularly, and the child was merry, and apparently quite indifferent to the singular condition. No satisfactory cause of their origin could be alleged.

A Case of Cylindroma Cerebri. By ALFRED W.
CAMPBELL, M.D.

THE specimens which I have placed under the microscope for
your inspection to-night serve to illustrate the anatomical
characters of that uncommon variety of vascular tumour, first
described by Billroth under the name Cylindroma. To recall
some points concerning the development, mode of growth, and
general distinctive features of this variety of growth, I may
briefly mention that in its primary stage it consists of a plexus
of cylindrical, endothelial offshoots, into which blood-vessels
are projected; that as the neoplasm grows, these blood-vessels
become hyaline, and the stroma, and in some instances the walls
of the blood-vessels, exhibit a tendency to undergo myxomatous
changes; so that in a fully developed part a microscopical
inspection reveals the existence of numerous thick, well-defined
hyaline rings (the altered blood-vessel) lying in a stroma com-
posed of capillaries and small round or oval cells, in which there
is evidence of more or less widespread myxomatous degenera-
tion.

The sites in which the tumour has been found are the orbit,
the parotid gland, the brain and its membranes, the peritoneum
(where it may grow to an enormous size—Orth), and the spinal
cord (Ganguillet).

There is a remarkable diversity of opinion among pathologists
concerning its classification. Some place it among the epithe-
liomata (Malassez, &c.), others look upon it as a sarcoma or
myxosarcoma (Ziegler, Hamilton, &c.), while Birch-Hirschfeld
describes it as an endothelioma. Though some lay stress on its
malignancy, the evidence of the majority tends to prove that it
is of slow growth, without tendency to secondary deposit.

The following is an abstract of the carefully-taken clinical
record of the case by my colleague, Dr W. F. Menzies. The
patient was a female, aged 56, admitted to the County Asylum,
Rainhill, April 8, 1889. Five years before admission, after a
sudden attack of faintness, a "fit" supervened, occasioning
unconsciousness and convulsions of the whole left side of the

body (facial and ocular muscles included). The attack lasted from two to three minutes, and from that period onwards similar "fits" recurred, at first at intervals of about three weeks, and subsequently more frequently. Two years after the above, the left eye became permanently everted, and the side of the mouth on the same side drawn up, and by this time there was great weakness and pain in the left side, so that locomotion became impossible. Six months before admission mental symptoms, further than the ordinary post-convulsive stupor, appeared; she became restless, emotional, and incoherent, and at night threw herself out of bed. She became dirty in her habits, and lost her perception of surroundings and her appreciation of time.

On admission the right pupil had a diameter of 4·4 m., the left of 5·5; reaction to accommodation was absent, and the light reflex only obtainable on exposure to a strong light. There was advanced optic atrophy, more marked in the left eye. She could barely distinguish light from darkness. The muscles of the left side of the face and mouth were in a condition of permanent contracture, and the left eye in a state of motionless external strabismus. The expression-marks of the left side of the face were eliminated, and there was considerable skin atrophy. Spastic rigidity existed in both extremities of the left side; the right-hand grasp was fair, but the leg was much weakened; the left patellar reflex was unobtainable from rigidity, the right very dull, and both Achilles reflexes were absent. Mentally she exhibited signs of agitated melancholia. Her memory and intelligence had almost entirely disappeared, and she could not feed herself.

She had no seizures while in the asylum, and died of exhaustion three months after admission.

At the autopsy, on removing the calvarium, the dura was found to be adherent to the subjacent structures at one spot over the middle of the right hemisphere; here a tumour, of the size of a walnut, bulging from the surface of the brain, was discovered; it was rounded in shape, and was situated in the middle of the descending limb of the intra-parietal sulcus, pressing anteriorly upon the ascending parietal gyrus, posteriorly

upon the inferior parietal gyrus, superiorly upon the supra-parietal gyrus, and inferiorly upon the supra-marginal gyrus. It was of a reddish brick colour, and of fleshy consistence; it was encapsuled, and, though partially adherent, could be easily shelled out; it seemed to have originated in the pia-arachnoid. There were no other growths in the brain or body, and the remainder of the examination provided no feature of importance.

Microscopically, the growth was not examined fresh, but portions were hardened in Müller's fluid, and afterwards in alcohol. These were imbedded and cut in celloidin, and sections were stained with alum-carmine, picro-carmine, china blue, safranin, hæmatoxylin and eosine, and gentian violet. A glance at the sections was sufficient to prove the character of the tumour. Scattered throughout the field were numerous hyaline rings of varying diameter, and these obviously appeared to be parts of a swollen and altered vessel-wall, viz., the media. In the vessels in which the media had undergone this change the endothelial lining was generally well preserved, but in some cases the adventitia was greatly thickened, and had participated in the hyaline transformation. In some instances there appeared to be a blood-vessel running independently in the centre of the hyaline media. This condition had been probably brought about by the projection of a new vessel into the thrombus of a hyaline vessel which had become blocked. One could in some cases see as many as three vessels, along with fibro-cellular elements, surrounded in this way by the hyaline ring. Some few vessels were observed with an almost normal muscular coat, others with the coat thickened and the muscle-fibres and nuclei faintly differentiated. This seemed to indicate an early stage of hyaline change. The stroma, which was plentiful, was made up of numerous round or oval cells, whose nuclei stained deeply with hæmatoxylin, along with numerous anastomosing vessels running in between and deriving support from the round cells. In some places the round-celled growth had undergone a myxomatous change, and been replaced by a reticulum of branching mucoid cells. This mucoid change in some cases affected the

hyaline cylinders also. In some of the sections calcareous bodies were found, resembling those occasionally seen in the choroid plexus.

A Case of Sarcoma Cerebri. By ALFRED W. CAMPBELL, M.D.

THE patient was a widower, aged 22. He was admitted to the County Asylum, Rainhill, on August 17, 1893, and died ten days later. Touching his history, he had apparently been healthy and intelligent from his childhood upwards. He had never acquired syphilis, nor was there any history of a head injury to account for the growth of the tumour. He first com-- plained of cephalalgia three years ago. Eleven months ago he experienced his first convulsive seizure. Such seizures have continued at intervals of a few days ever since. His sight began to fail three months before admission. When admitted he was extremely stuporose, his head was thrown back, and he evidently suffered from intense headache. He also presented a vacant facial expression, and his speech was indistinct. He was apparently anæsthesic over his whole right side, his right arm was weak, and the right hand œdematous. Paresis of the muscles of the right side of the face and of the left external rectus also existed. His pupils did not react to light, and on ophthalmo-scopic examination intense double optic neuritis, with retinal hæmorrhage, was discovered. A succession of convulsive attacks, in which the spasms commenced in and mainly involved the muscles of the left side of the body, led to a fatal termination.[1]

Autopsy.—The calvarium was considerably thickened and its density increased. On its inner surface it was rough to the touch, and close inspection revealed the presence of numerous minute conical bony spicules. All the venous sinuses were empty, and on reflecting the dura absolutely no subdural or subarachnoid fluid was visible. The surface of the brain was extremely pale and dry—almost resembling putty in appearance. The vessels of the inner meninges were flattened and empty,

[1] The above notes were taken from the clinical report made by my colleague, Dr T. W. Hinds.

and the meninges themselves closely applied, thin and difficult to detach. About 2 drachms of dark, extravasated blood-clot were found over the left frontal region; its source was obviously the subjacent tumour, which appeared on the surface as a bulging, softened, reddish hæmorrhagic area, involving parts of the 1st, 2nd, and 3rd, and ascending frontal convolutions. The left hemisphere scaled 739 grammes, against 632 grammes by the right; its frontal segment was considerably enlarged, and the inner surface of the same segment of the right hemisphere was correspondingly indented. On section, the tumour was rounded, infiltrating, of rather softened consistence, of a bluish pink colour, and of the size indicated in the accompanying drawing. To the naked eye it resembled a glioma, but sections from the growth were made, both fresh and after hardening, and these proved that it consisted of a groundwork of small round or oval cells, in which there were numerous blood-vessels and many unresolved hæmorrhages. No spider cells were discovered, but studded throughout the field were numbers of colloid bodies, which were not tinted by hæmatoxylin or aniline blue-black; gave a pale straw-yellow reaction with iodine, and stained intensely with fuchsin.

Note.—Cerebral sarcomata rarely arise in the cerebral substance itself, but generally result from a primary growth in the dura mater, or in the periosteum covering the cranial bones. This case, therefore, is of particular interest, since the new growth unquestionably commenced in the former situation; it is further of interest in furnishing us with an example of a primary sarcoma cerebri (no trace of any similar growth in the body was discoverable). Lastly, with reference to the above-mentioned colloid bodies, these seem to represent the remains of destroyed medullated nerve-fibres, and are not to be confounded with corpora amylacea, the staining reactions of which are entirely different, and one cannot assume that they are artefacts, as they are present in sections which were cut immediately the brain was removed.

November 23, 1893.

DR CARTER showed this patient, G. W., a sailor aged 38, as an example of locomotor ataxy, apparently caused by drinking impure water. It was not mentioned as a case of *progressive* locomotor ataxy, for the method of treatment was what one could never employ in that affection, and the rapid improvement in the symptoms—the man being now almost well—differentiated it strongly therefrom. The patient's ship, served by a thoroughly sound and healthy crew, put into Rangoon eight months ago for water. He stated that the water was perceptibly bad, and that within two months twenty-two of those on board, including the captain, became ill, the captain and one sailor dying. The illnesses, with some minor variations, were substantially of the same type. The patient himself suffered, firstly, from severe headache, accompanied by suffused conjunctivæ and impaired vision; these symptoms were followed by epigastric pain and obstinate vomiting, after which darting pains came on in the lower extremities, together with increasing impairment of locomotion. He had been in hospital at Ascension Island for six weeks, and was sent directly from the ship which brought him home to the Royal Southern Hospital. When admitted, he could, with great difficulty, walk a few paces, the gait being very ataxic. He could not stand with the feet close together, even when the eyes were open. He complained of impaired sensibility in the soles of his feet; the patellar reflexes were absent. Strychnine, in gradually increasing doses, was administered, commencing with five minims of the solution of the hydrochlorate. Improvement soon began to manifest itself; and now, after eight weeks, he is almost well, the patellar reflexes being, however, still absent.

December 21, 1893.

Case of Chylous Pleural Effusion and Chylous Ascites.   By
Dr BRADSHAW.

H. L., aged 36, sailor.   Admitted to the Royal Infirmary
August 31, 1893, with dyspnœa and anasarca. History of rheu-
matic fever 9 years before.

State on admission and ensuing few days:—Great distress,
dyspnœa, anasarca. Effusion in right pleura, ascites. Heart
and vessels:—aortic regurgitation (slight), high tension. Urine:
—scanty, sp. gr. 1012, albumen $\frac{1}{6}$, no casts, no blood. Right
pleural effusion milky, clearing when shaken with ether.
Ascitic fluid like pure milk to the naked eye, setting into a
clot like blanc-mange.

Analysis proved the presence of chyle in both these fluids.
Filaria were sought for in the blood, but none were found.
Subsequently a serous effusion was found in the left pleura, and
at one time signs of pericardial effusion were made out. Tap-
ping was performed several times on both pleuræ and on the
abdomen. The ascitic fluid gradually diminished; the right
pleural effusion lost its milky character before it disappeared
altogether.

The patient had improved, but was still under treatment in
hospital.

Mr Froysell, of the Chemical Laboratory, University College,
kindly made an analysis of the ascitic fluid, and of that from the
right pleura, and found fat and glucose present in both, in
measurable quantities.   No satisfactory explanation of the
presence of chyle in the serous cavities offered itself; but it
was worthy of remark that the right pleura was thus affected,
and that the right arm was swollen at first to a great size,
while the left was hardly swollen at all.

Man with Gouty Deposits.   By Dr BRADSHAW.

F. M., aged 40, public-house manager.

Commencement 14 years ago in ankles. Progressive extension to big toes, knees, hips, shoulders, and hands. Right ring-finger began to be affected 4 years ago.

No history of lead. No other illness. Until four years ago used to drink 3 or 4 pints of beer daily. None since.

Family history negative.

Present condition.—Enormous swelling of right ring-finger, which is exquisitely painful, is suppurating and discharging urates. Deposits in left index-finger, bursæ olecranorum, outer side of feet, piuna, &c.

Heart, lungs, and kidneys normal.

Surgical Cases.

November 9, 1893.

Case of Hair-Bezoar from the Human Stomach. By F. T. PAUL, F.R.C.S., Surgeon to the Liverpool Royal Infirmary.

E. K., aged 21 ; a housemaid. The patient was a girl of quiet and reserved manner, but not at all hysterical. As a child she was healthy, but pale and slim. At the age of 15 she was first observed to contract a habit of pulling her hair into her mouth, and biting the ends. From this she dropped into the habit of eating it ; actually pulling it out of her head for this purpose. She would also unwind cotton, roll it up into a ball, and swallow it. These habits, notwithstanding the protests of her friends, she continued until her death.

About two years before her death severe dyspeptic symptoms set in, accompanied with pain, vomiting, and later with hæmatemesis. In time she became too ill to work, and on returning to her home in the country she came under the care

of Dr Peirce of Hoylake. He discovered that in addition to her gastric symptoms there was a large and hard tumefaction to be felt over the region of the stomach.

October 30, 1892, I saw the patient in consultation with Dr Peirce. The chief object of this consultation was to decide whether it was desirable to make an exploratory incision in order to ascertain the nature of the tumour, and with a view to its removal if feasible. At this time the girl was anæmic and thin. She had frequent spells of vomiting, lasting several hours, with intervals of some days, during which she took fluid food without any vomiting at all. The tumour felt something like a cricket-ball, and gave the impression that it was hard and adherent, no doubt owing to contraction of the abdominal muscles over it, for it was not really adherent, nor anything like so hard as it felt, though it must have been very much larger. It was tender on pressure.

Although the patient was weak, we agreed that she would bear an operation, and strongly advised it; but though we were supported by her parents, no persuasion would induce her to submit, nor would she even come into the infirmary for observation on the promise that no operation whatever should be undertaken. She continued without improvement for months, and though again urged to consent to the operation would not yield. In March 1893 she had a very bad hæmatemesis, from which she was expected to die, but rallying again, lived till the end of May. The parents permitted a post-mortem examination, which was at once undertaken by Drs Peirce and M'Aulay. They found in the stomach and duodenum this large mass of hair mixed with a small amount of cotton and string. The latter were almost entirely situated in the duodenum; and from the small amount and situation of these materials, considered with her known habits, it would appear that cotton fibres have either much less tendency to felt in the stomach, or are much more destructible in the digestive juices than hair: both of which propositions are probably true. The hair was of the same colour and texture as that of her own head; it was felted together into a complete cast of the stomach and duodenum.

In its present state it has been cleaned and dried, and is now comparatively light in weight, and measures 22½ inches long by only 8 inches in circumference ; but when it was fresh, it weighed 3 or 4 lbs., and was quite twice the bulk it is now. The only other pathological conditions found were a small ulcer at the greater curvature, and the usual evidences of anæmia.

At various times examples of this extraordinary condition have been recorded. One of the oldest specimens I am acquainted with is in the museum of the Medical School. It was taken from the body of a lady aged 34, a patient of the late Dr Dickinson. She used to remove the hair from her comb night and morning, and swallow it. The case is referred to in the volume of the *British Medical Journal* for 1869 by Dr Inman of Rodney Street. Another interesting case is recorded about the same time by Dr John Russell, in which a mass of hair weighing 4½ lbs. was removed from the body of a married lady aged 31. She was known to have had a tumour in the region of the stomach for 17 years. In 1871 Sir William Gull brought before the Clinical Society the case of a lady, also married and with a family, who died from perforating ulcer of the duodenum, the result of a large mass of hair and string filling the stomach and duodenum. The hair, by its various colours and characters, proved to have been derived from her own head and the heads of her children. In 1884 Mr Knowsley Thornton recorded a successful case of gastrotomy for the removal of a similar mass of hair from the stomach of a girl aged 18. Several cases of insane patients have been noted in which pieces of blanket, rag, cocoa-fibre, straw, chips, &c., have been swallowed. A valuable specimen of this class was recently presented to the Medical School museum by Dr Wiglesworth of the County Asylum, Rainhill.

Perhaps the two most interesting points in connection with cases of this kind are the motive or cause for such a strange habit, and the treatment for the resulting bezoar, if that name can be correctly applied to the ball of hair. The perverted appetite is certainly not a phase of hysteria, for none of the cases recorded appear to have occurred in hysterical subjects.

I doubt if any better explanation can be given than that offered by Sir William Gull in 1871. He suggested that it "might depend upon some all but extinct instinct which shows itself in some of the lower animals. It appears that certain breeds of cats are apt to commit involuntary suicide by swallowing the hair of their coats, and most museums contain hair-bezoars of different kinds from horses and cows." Dr Wilks also "thought the action was instinctive." "Perhaps," he said, "it was a relic of the feline descent of females." As was also pointed out by Sir William Gull, the motive in these cases must be distinguished from the swallowing of foreign matters by the insane, or of foreign bodies, like knives, for profit or bravado.
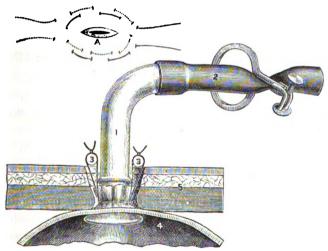
As regards treatment, the digestive juices are absolutely inert as applied to hair; the mass cannot be expelled by the peristaltic movements of the stomach, nor displaced by any effort at vomiting; therefore a hair-bezoar once formed, gastrotomy offers the only hope of cure, and it is encouraging to recall that Dr Knowsley Thornton, so long as ten years ago, placed a brilliant result on record, the subsequent history of which it would be very interesting to meet with.

Gastrostomy in One Stage. By F. T. PAUL, F.R.C.S., Surgeon to the Liverpool Royal Infirmary.

THE history of the operation of gastrostomy is clearly divided into two eras—that before and that since the practice advocated by Howse of undertaking the procedure in two stages. Previously the mortality was almost prohibitory; subsequently it has been greatly reduced, and is now variously estimated at from 30 to 70 per cent., the correct mean probably approaching something like 50 per cent. for all operators. The reason that the mortality still remains so high is undoubtedly the late stage of the disease at which the operation is put into practice, for the simple exposure and attachment of the stomach to an abdominal wound would very rarely be fatal in a healthy subject. Jacobson, giving his own experience of nine cases in 1891, says, "In three patients the operation was asked for too

late." Treeves says, "One thing is certain, and that is—the operation is usually carried out too late." All surgeons of any experience in this matter say the same; and yet the prospect of systematically operating earlier in the disease seems remote, as this method of treatment is neither encouraged by physicians nor readily approved by patients, except as a "forlorn hope."

Under these circumstances I beg to recommend the following method of opening the stomach at one operation, with power to feed the patient at once. The proceeding is very simple. The preliminary stages of the operation are conducted as usual; but when the stomach is picked up, a portion of it is drawn out of the wound, and two running sutures of fairly stout silk are passed in a circle round the site of the intended opening (A) with their ends in opposite directions, care being taken not to include the mucous membrane. The opening is then made, and

Gastrostomy in One Stage.

A. Method of passing the ligatures in the stomach. 1. Glass tube. 2. Rubber tube with clip. 3,3. Sectional view of glass rods over which the ligatures are tied. 4. Interior of the stomach. 5. Abdominal wall.

each side of it being grasped with artery forceps, one of my small ($\frac{1}{4}$-inch) intestinal glass drainage-tubes is inserted, and the ligatures are drawn tight and tied. The exposed part of the stomach is now washed and returned into the abdomen; the

external wound drawn together with fishing-gut sutures, and
the ends of the stomach ligatures tied over two glass rods (3,3)
crossing the wound, in order that the stomach may be kept in
close contact with the peritoneal surface of the abdominal wall.
The wound is then powdered with iodoform, dressed with
cyanide gauze and salicylic wool, and a bandage applied; a
piece of jaconet being placed outside over the dressings to pre-
serve them from becoming soiled.   The experience of many
bowel cases has shown me that these tubes separate between
the third and the seventh day; therefore, from the moment of the
completion of the operation to the third day, the administration
of food or washing out the stomach may be carried on with
impunity.   On the morning of the third day the wound should
be dressed; and from this time until the tube separates, and it
is clear that good adhesions have formed, discretion should be
exercised as to the amount of food given and the care with
which it is administered.   If we may judge by analogy, expe-
rience with the colon and with one case of gastrostomy seems to
show that when the tube separates the surrounding adhesions
are sound and strong, and the fistulous opening is safe and
efficient.   The operation employed in this way is rapid and
easy.   The original wound may be much smaller than that
usually recommended for gastrostomy, and the early stages of
repair are conducted under such absolutely safe conditions, as
regards leakage, that the personal supervision of the surgeon is
quite unnecessary—a matter of considerable importance in
private practice.   In colotomy, especially, cases must often be
left in the entire charge of the practitioner, who probably has
no desire to be responsible for completing the final stage of the
operation by himself a few days hence.   With the glass tube
ligatured into the sigmoid or cæcum I have so left cases without
seeing them again, and in no instance has the practitioner had
the least cause for anxiety.

  The details of the only case of gastrostomy in which I have
had the opportunity of using the tube may be very shortly
given.   They indicate that its use is as safe in the stomach as
in the bowel; but this particular case proved to be a peculiarly

unfortunate one to have selected for the operation, as the growth had already crept from the cardiac to the pyloric end of the stomach, and blocked both orifices. The gentleman, the subject of the operation, was under the care of Dr J. H. Evans of Waterloo, with whom and with Dr Glynn I saw him in consultation. He had malignant stricture of the œsophagus at the cardiac orifice of the stomach, which was now so advanced as to be almost impervious, and he was suffering intensely from deprivation of food and thirst. He had seen several consulting physicians in London, Edinburgh, and elsewhere, and the general advice had been to leave things alone until the symptoms became urgent. This was certainly now the case. I tried on two occasions to pass a bougie. Both were unsuccessful, though the second was thorough and prolonged, and borne by him with marked patience and fortitude. He now willingly accepted the prospect offered by gastrostomy; and being almost *in extremis*, and most urgently in need of immediate relief, I deemed it a suitable case in which to employ the above suggested plan of performing the operation in one stage. It was carried out exactly on the lines indicated without hitch or difficulty of any kind, and when he was put back to bed his condition had scarcely at all altered for the worse. As soon as the clip on the rubber-tube was removed, with the intention of passing a little peptonised milk and brandy into his stomach, there escaped nearly a pint of foul, thin, yellow fluid, containing about 50 almost unaltered dried currants. The organ was, therefore, washed out with warm water before introducing the nourishment. The introduction of fluid into the stomach was effected by simply attaching a funnel to the free end of the rubber-tube. We found, on inquiry, that the last possible currants must have been swallowed at least six or seven weeks previously; it was, therefore, evident that they had been retained in the stomach ever since, and that the growth must long ago have extended along the lesser curvature and blocked the pylorus. The subsequent course of the case corroborated this view, for many more currants were washed out, and though we were able to, and did,

inject plenty of fluid food, apparently very little was absorbed
in the presence of the foul cancerous discharge. The thirst
continued, the emaciation rapidly progressed, and he died from
starvation, without any febrile disturbance and without any sign
of abdominal pain, five days after the operation. In the mean-
time the tube held perfectly for three days and a half, when, as
fluid began to escape beside it, I removed it; but good adhe-
sions had formed, and the fistulous opening was safe for use.
During the last two days of his life we washed out the stomach
and injected the food through the opening as easily as before,
though, unfortunately, he derived no more benefit from it. It was
not possible to make a post-mortem examination; but it was
quite clear that, though the operation did not relieve the symp-
toms, it was perfectly successful in establishing a fistulous
communication with the stomach in a most unpromising subject.
And though the operation might be held responsible for not
keeping the patient alive, it certainly was not responsible for
his death. Had this gentleman lived longer, I should have
discovered whether a fistula produced in this way was likely to
prove unduly large; but my belief is that, owing to the smaller
surface of stomach exposed at the bottom of the wound, and the
more complete closure of the external wound, the fistula has
greater opportunities of contracting, and is less likely to form a
patulous opening than is the case with Howse's method. At
the same time, if advisable, a metal tube of very small diameter
could be used, which would give as narrow a fistula as could be
desired.

*Two Cases of Sarcoma of the Larynx, with Remarks on the
    Nature of the Growth.* By F. T. PAUL, F.R.C.S., Surgeon
    to the Liverpool Royal Infirmary.

CASE I.—Intrinsic sarcoma of the larynx. Cyril W., aged 12.
The patient is a sturdy, healthy-looking lad, with no other com-
plaint. About eight months ago some little interference with
breathing was first noticed; but very little attention was paid

to this, until ten weeks ago when he became hoarse. The
respiratory obstruction now rapidly increased, and tracheotomy
had to be performed four weeks before admission. He at first
came under the care of my colleague, Dr Middlemass Hunt,
who, on examining him with the laryngoscope, found the entire
larynx filled with a large white cauliflower-like mass, rising
nearly to the tip of the epiglottis. It looked like papilloma;
but on attempting to remove portions, they were found to be
much harder, and could only be brought away by using cutting
forceps. It bled very freely. Dr Hunt operated about twice
a week for a month, by which time he had removed all the
growths—a large quantity—down to the level of the vocal
cords, when it became apparent that the base of the tumour
within the larynx was too extensive to be dealt with by the
intra-laryngeal method, especially as the microscope declared
the portions removed to be of a sarcomatous nature. He there-
fore requested me to take over the case, and excise the growth
by an extra-laryngeal operation.

On September 28th, chloroform having been administered
through the tracheotomy-tube, I proceeded, with the assistance
of Dr Hunt, to explore the larynx by division of the thyroid
cartilage and cricothyroid membrane. Upon holding these
parts open with blunt hooks, the cavity of the larynx was seen
to be completely filled with a fleshy-looking and slightly lobu-
lated tumour. It was easily turned out with a curette, and
was apparently only adherent to the lining membrane of the
larynx at the front and right side opposite the thyroid cartilage,
and not over a larger area than a threepenny piece. This area
was well scraped with a sharp spoon, and then the cut edges of
the cartilage were neatly brought together with a few sutures
of green catgut, and the external wound closed in the same
way. No difficulty was met with during the operation.

The boy made an excellent recovery. The wound united by
first intention; and having ascertained by two or three trials
that he could breathe perfectly well through the larynx, the
tracheotomy-tube was finally discarded on October 9th, ten
days after the operation. At the date of showing the patient,

November 23rd, he was quite free from recurrence, as the larynx was examined by several laryngologists, and pronounced perfectly normal, with the exception of a slight dimple where the pedicle had been scraped away. The patient is still free from recurrence in January 1894. The tumour removed formed a cast of the interior of the larynx. It measured 1 inch in length, and from ⅜ to ¾ inch in diameter. It was quite smooth externally, but slightly lobulated above.

The interest attaching to the tumour, and indeed to the whole case, is the histological structure of the growth, for upon this rests the interpretation of the chief clinical features. To remove a sarcoma from almost any other part of the body in the imperfect manner adopted in this case would be a most unwise and hopeless proceeding; but in the larynx we are encouraged to remove the growth without sacrificing the organ, because previous clinical experience of sarcoma in this position affords much evidence of the generally mild and modified character of its malignancy.[1] I am not sure if there is any definite histological evidence to explain and support this clinical experience. If such is wanting, the record of this and the following specimens may perhaps constitute a useful contribution to the subject. What I wish to show by them is that, in the light of their structure, their almost innocent character is not at all mysterious. One meets with the same kind of tumour occasionally in other parts of the body, where it is equally innocent; but nowhere is it of so much importance as in such a pre-eminently valuable organ as the larynx for the surgeon to recognise those minute differences of structure which tell of the clinical character of the growth, and warn him as to the amount of normal tissue which it is necessary to sacrifice.

Sections taken from portions of the growth originally removed by Dr Hunt showed it to be a spindle-celled sarcoma. Now the malignancy of spindle-celled sarcoma varies within the widest possible limits. Under this name we include tumours as malignant as any species known, as well as the mildly malignant growths formerly called recurrent fibroids, and others

[1] Butlin, *Tumours of the Larynx.*

which are scarcely to be distinguished from the innocent
fibromata. Though all are commonly included in one group,
these widely different clinical characters always go with equally
distinct histological details; and in well-prepared sections the
microscope decides not only that a certain tumour is spindle-
celled, but whether it is a malignant, semi-malignant, or inno-
cent spindle-celled tumour. These characters, as a matter of
fact, depend upon the state of evolution attained by the cells of
which the tumour is composed. The ultimate development of
a spindle-cell of this class is seen in wavy fibrous tissue, and
the more nearly the cells of a spindle-celled sarcoma approxi-
mate to this condition the less malignant it is. The different
groups of spindle-celled sarcoma pass from one to the other
without any definite line of demarcation; still certain frequently
recurring features may be taken to emphasise types, and in this
way I would suggest that four sub-varieties be recognised :—
(1) Cell-wall barely or not at all distinguishable, the spindle
character being recognised by the elongated nuclei of the cells
which often appear as though scattered through a uniform pro-
toplasm. These tumours are the most malignant, and usually
originate in periosteum, and muscular, glandular, and other
fasciæ. (2) Cell-wall clearly defined. These tumours are much
less malignant. The recurrent fibroid, and the myeloid epulis
may be taken as examples. (3) Outer portion of cells fibril-
lating, the fibres of one anastomosing with those of another.
These tumours, when the fibrillation is decided, are almost or
quite as innocent as a simple myxoma. I have met with a few
examples in the deep fascia of the anterior abdominal wall.
When the fibrillation is less marked, of course, they lean towards
the recurrent fibroid type. (4) Cells mostly fibrillated, but
large oval nuclei scattered through the tissue. Such tumours
merge into the innocent fibrous growth met with in pen-
dulous tumours of the labia and other parts of the skin, or in
keloid. It is only when their structure inclines towards that
of the previous group that there could be any question of
possible malignancy. In all cases, of course, the characters
indicated above must be considered in conjunction with any

others bearing upon the same point; such as the number and nature of the nuclei, infiltration of tissues, &c.

The growth in the case of the boy under discussion, as may be seen by reference to fig. 1, belongs to sub-variety (3). It has all the characters which point to the least malignant end of the scale of spindle-celled sarcoma, without allowing any question that it is a genuine sarcoma, and not a simple benign growth. If this case is at all typical of the laryngeal sarcomata, it shows how important is a thorough microscopical examination of a portion of the growth before proceeding to operate.

CASE II.—Extrinsic sarcoma of the larynx. Elizabeth B.

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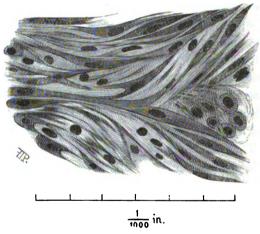
FIG. 1.—Spindle-celled Sarcoma of the Larynx, showing commencing Fibrillation of the Cells.[1]

aged 20. This patient was also under my care, conjointly with my colleague Dr Hunt. She was a slight, rather delicate-looking girl, but previous to her present trouble had always enjoyed good health. Two years ago she first noticed some difficulty in breathing, which about six months back became decidedly worse. She had lost flesh lately. Her neck is thin, and deep down on the right side, between the sterno-mastoid and the larynx, a fulness is readily detected. The cartilages of the larynx feel normal, but are certainly a little displaced to the left. The top of the trachea is somewhat thickened. Over the

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[1] In the engraving the whole tissue is represented as being too fibrous.

fulness are one or two nodules which might be small hard glands. Her voice is not very much affected, and she breathes fairly well when quiet in the ward during the day, but snores and chokes a good deal at night. Dr Hunt reports that the only portion of the larynx visible by the laryngoscope is the epiglottis, which is normal in shape and colour. The rest of the larynx is hidden by some smooth, pale, rounded growths, which spring from the posterior wall of the pharynx at the level of the epiglottis, and also fill the right pyriform sinus. The growths appear to be covered with normal mucous membrane,

ob.7, oc.2.
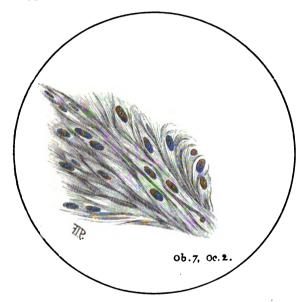
FIG. 2.—Spindle-celled Sarcoma of the Larynx, showing marked Fibrillation of the Cells.

and there is no ulceration anywhere. Occasionally, when the epiglottis is raised, a momentary view of the interior of the larynx is obtained. It appears to be quite free from growths. A small portion of one of the polypoid growths was removed with the laryngeal forceps for microscopical examination. It was very tough, and required a considerable tug to get it away. After preparation in chromic acid for twenty-four hours, sections were prepared which showed the appearance seen in fig. 2.

The basis structure is composed of interlacing fibres, between which are large oval nuclei, each with a single bright nucleolus. The nuclei and fibres are evidently the final stage of development of a spindle-celled growth. Under a low power it is seen that the bundles of cells or fibres, though generally adopting the wavy or interlacing distribution of spindle-celled tumours, have also a marked tendency in many parts to a spherical arrangement, in which the cells are, so to speak, wound round a centre. Thus the histological features of the portion of tumour removed correspond with sub-variety (4), and, as such, must be regarded as of an almost or altogether innocent nature. Under these circumstances it was decided to explore the external fulness, and ascertain how far it was possible to extirpate that portion of the tumour situated in the neck; since, if this could be removed, Dr Hunt was prepared to clear out, by an internal operation, all that was visible through the mouth. Accordingly, chloroform having been given, with the tracheotomy instruments at hand, and the patient having been got under without very much embarrassment to respiration, an incision was made along the edge of the sterno-mastoid. The growth, however, was deeply situated, and before it could be reached tracheotomy became urgently necessary. In doing this, information was obtained which proved that the exploratory operation could yield no success; for, on the right side of the trachea, white nodules of the growth were visible clinging closely to the cartilages, and causing the membranous portion behind to bulge into the lumen of the tube. The growth evidently extended from the point where it was visible in the pharynx above, down between the latter and the larynx to partially surround the trachea below; and whatever its true nature, it had a very malignant-like distribution; therefore I have, at any rate for the present, given up all thoughts of a further operation, as I consider the question of entire removal could hardly be entertained in a robust subject, much less in this slight and delicate girl.

I took the opportunity to shell out a few of the peculiar nodules which showed up beside the trachea. When cut into,

this part of the tumour looked white and bloodless, and the nodules readily shelled out, almost as though they were little encapsuled growths. I never remember seeing a tumour come to pieces in this sort of way before ; the little spherical nodules, about ⅛ inch in diameter, seemed to be almost naturally extruded when the growth was cut into. After careful hardening in bichromate of ammonia, these pieces presented, under the microscope, identically the same structure as that already described ; and I assume that the tendency shown by the bundles of cells to a centrifugal arrangement accounts for the naked-eye appearance of the tumour, which was something like a number of little balls of growth loosely connected together. The patient continues, in January, to wear the tracheotomy-tube, which she is quite unable to dispense with ; and I very much fear that, notwithstanding the remarkably innocent structure of the tumour, there is little or no prospect of improvement. At some future time I shall hope to be in a position to make a fuller statement as to the pathological anatomy of this unusual case.

Multiple Papillomata of Larynx ; Tracheotomy ; Removal of Growths by Intra-Laryngeal Operation ; Cure. By MIDDLEMASS HUNT, M.B., Laryngologist to the Royal Infirmary.

O. H., æt. 11, was sent to me by Dr Hamilton, of Chester, in November 1891, with the following history. At the age of 4 he became hoarse, and soon lost his voice completely. His breathing also became noisy, especially on exertion and during sleep.

In August 1890, on account of sudden attack of difficulty in breathing, Dr Archer, of Chester, had to perform a rapid tracheotomy, and the patient had worn the canula ever since. On laryngoscopic examination, the whole larynx was found to be filled with a white cauliflower-like mass of growths, reaching as high as the tip of the epiglottis.

I proceeded to clear out the growths by means of forceps and snare, using the latter for the larger pieces.

When the larynx was sufficiently cleared to allow the free

passage of air, the patient was taken into the Northern Hospital by Mr George Hamilton, where the tracheotomy-tube was removed with considerable difficulty. He then came back to me, and had the remains of the growths removed by means of Schroetter's forceps

Though it is now two years since the growths were removed there has been no recurrence. This is the more remarkable in view of the extensive surface from which they were found to originate, namely, the free border and under-surface of both cords in their whole length, the inter-arytenoid space, and the right ventricular band. The result as regards voice has been excellent, and he now speaks in a good clear voice that will serve him for all the ordinary business of life.

December 7, 1893.

A Case of Microcephalus. By R. W. MURRAY, F.R.C.S., Surgeon, Children's Infirmary.

OPERATIVE interference in cases of microcephalus has been frequently practised of recent years both on the Continent and in America, and not a few cases have been operated upon in this country. As the treatment is a comparatively new one, and likely to become fashionable on account of the marked advantages that have followed it in some cases, and also on account of it being strongly advocated by distinguished members of the profession, I thought it might be interesting, if not instructive, to relate a fatal case that occurred in my own practice, and to draw your attention to some of the dangers likely to follow opening the skull in this class of case.

The pathology of this affection is still obscure, for it is by no means clear whether the small skull is the cause or the conse-

quence of the small brain. But as Professor Horsley points out, although the primary defect may not be in the cranial bones, yet there is abundant evidence to show that the brain in cases of microcephalus is exposed to increased pressure, and therefore relief of pressure might act beneficially in allowing the stunted brain to develop with greater rapidity.

The account of my case is briefly the following :—

Alfred R., a microcephalic male infant of 2 years 8 months, attended as an out-patient, during September last, at the Children's Infirmary under the care of Dr Nisbet, who transferred the case to me with a view to operation. He was one of twins, the other child being still-born. The labour was a protracted one, and the child was so small and feeble, that it was extremely doubtful whether it would live. You are all familiar with the general appearance of microcephalic children, so I will not burden you with a detailed description of this particular case, and will only say that at the age of 2 years 8 months, when he first came under my notice, he was a puny infant with a very small skull which was compressed laterally, and had the usual well-marked keel in the line of the sagittal suture with no sign of a fontanelle. His condition was that of absolute helplessness, for not only was he unable to sit up, but could not even turn himself from one side to the other when lying in bed.

The dangers and possible advantages of operative interference were explained to the mother, she willingly consented, and the child was admitted on September 27, 1893.

On October 16 I removed with a ½-inch trephine two discs one inch apart, together with the intermediate bone from the left side of the skull parallel with the sagittal suture, corresponding to part of the frontal lobe and upper part of the ascending frontal convolution. No noticeable change either of pulse or respiration occurred during the operation, and that night the child's condition was much as it had been previously, with the exception that the temperature rose to between 100° and 101°. Next morning the temperature rapidly rose to 104°, the pulse became rapid and irregular, and there was marked cyanosis with collapse; in fact, the child was obviously dying. The

wound was dressed, but it was in every way satisfactory. The temperature was reduced to 103° by sponging, but death took place the same morning apparently from cardiac failure, twenty-four hours after operation. A post-mortem was made four and a half hours after death: the wound had a perfectly healthy appearance, the exposed dura mater appeared normal. The subjacent membranes and the part of the brain corresponding to the trephine opening, showed no signs of inflammation to the naked eye, and they had apparently been in no way injured.

The brain was unusually small, and in the occipital region of either hemisphere there were two large cysts which were filled with clear fluid. I propose to examine the brain more carefully, and bring it before the next meeting of the Pathological Section of this Society.

The question naturally arises, What was the cause of death? For I must ask you to take my word for it, that it was not due to meningitis or septic poisoning. Before answering this question, I should like to draw your attention to several other fatal cases that have been reported. In the *International Journal* of 1891, Dr W. Keen relates three of his own cases, and in the *B. M. J.* of 1891, Professor Horsley gives an account of two cases upon which he operated. Now out of these five cases there were two deaths. I select the work of these two gentlemen, because they are surgeons of recognised skill, and both have devoted much attention to cerebral surgery. Dr Keen's fatal case was that of an infant sixteen months: two discs of bone 5 inches apart had been removed with a ½-inch trephine in a line parallel with and close to the sagittal suture, the intermediate bone removed with forceps. The child's condition was apparently in every way satisfactory an hour and a quarter after operation, when it died suddenly from heart failure.

In Professor Horsley's case, the child was 7 years old; a considerable amount of bone was removed, and during the operation the pulse became irregular and the respiration markedly quickened; the temperature rose *immediately* after the operation, and death took place three days later from hyperpyrexia. The post-mortem showed that death had not been caused by

septic poisoning. Now, in order to account for those unlooked-for disturbances in the temperature, heart, or respiration following simple trephining or craniotomy in microcephalus, I would remind you of the more or less recent teaching of physiology.

It has, I think, been demonstrated by Landois, Horsley, Hale White, and others, that the thermotaxic centre is represented in the cerebral cortex, and being developed later than the thermogenetic or thermolytic centres is therefore probably the most unstable. Whether the heart and lungs are also represented in the cerebral cortex, I do not know. However, in many of the cases of microcephalus that have been operated upon successfully, there has been, either during the operation or shortly afterwards, marked disturbances of either the pulse, respiration, or temperature without any very obvious cause. And I take it that Professor Horsley's explanation is probably the correct one, viz., that the heat-centres and others—which, in an imperfectly developed brain, are probably more unstable than usual—are unable to resist the unfavourable traumatic impression which the nature of the operation induces. For however careful one may be, you cannot remove large portions of bone from a child's skull without causing some harmful impression on the subjacent structures.

Whether the operation of removing portions of the skull in cases of microcephalus is to become a recognised one in surgery time alone must show; and, in conclusion, I will say that the lessons I have learnt from my own limited experience, and from the reported cases of other surgeons, is, to be content to remove small portions of bone at a time, even a single disc with a ½ or ¾ inch trephine, and to repeat the operation if the results are encouraging.

Removal of the Uterine Appendages, followed by Double Hæmatocele: Suppuration: Recovery. By GEORGE A. HAWKINS-AMBLER, F.R.C.S.E., &c.

THE case which I have the honour to relate, as briefly as possible, is not one of the brilliant cases we generally hear of, but, in some respects, an unfortunate one. Still, I venture to

hope it may prove of some interest, and for more than one reason. In the first place, though post-operation hæmatocele is common enough, and occurs with greater frequency than is either recognised or acknowledged, the existence of intra-peritoneal hæmatocele and extra-peritoneal hæmatoma or hæmatocele together is not so frequent. In this case, too, there was a great deal of hæmorrhage prior to the formation of the hæmatoceles, and both blood collections suppurated. The whole record affords another example of the fact that an operation may be the simplest in the world, yet, in its after-treatment, call for the most anxious attention from all connected with it.

In 1891, I was asked to operate on the wife of a clergyman, aged 27, who had a retroflexed, somewhat adherent uterus, and who suffered from menorrhagia, dysmenorrhœa, and general illness so severely, that she was quite unable to live with comfort, much less to discharge the many duties expected from women in her position. I decided to do Tait's operation, as all other treatment had been perseveringly tried without affording any relief, and the patient was more anxious to be cured than to add to her family of two, had that been possible. In saying that we selected " Tait's operation," I speak advisedly. Though this proceeding consists in the removal of the uterine appendages, the removal of these appendages does not of necessity mean Tait's operation.

Mr Tait has justly objected to an operation being ticketed with his own name, or that of any other surgeon, and I quite share his objection. Still, here we have an operation not merely invented by him, but done in a special way; and it is the operation done in his own way that I designate by this name, not merely the operation he introduced. Here we have something done for a specific purpose, to induce the menopause, removing organs which may or may not be diseased in themselves. No operator living can do more than speculate on what it is in the parts removed that regulates menstruation. No one is able to demonstrate that any operation but this, performed in this way, will most generally stop menstruation immediately, nor do we know whether the structures removed contain a local, automatic

centre in which the function originates, and from which it is
controlled, or whether it is a subordinate centre, through which
is manifested the result of the physiological labour of the whole
organism.   I believe Tait's operation will most surely stop
menstruation, and therefore that it is the best proceeding for
the purpose, as well as for the relief and cure of multinodular
myomata, for its author does not claim that it will generally, if
often, cure the soft œdematous variety.   I think surgeons who
undervalue a surgical proceeding and question results, without
ever doing the operation on which the results are claimed, are
not merely unscientific, but distinctly unfair.   I am convinced,
too, that it is nonsense to go on removing most of an ovary and
half a tube, and leave a patient sometimes unrelieved by the
risk to which she has submitted, while we talk about pathology
and physiology of parts we do not understand.   I do not care
whether the results obtained are due to the inclusion of " John-
stou's nerve " in the parts ablated, or of any other nerve
mechanism which influences menstruation ; whether, by the
more complete proceeding, a greater number of arteries are
tied, or whether it simply means that in this way the ovary is
more likely to be completely removed.   I would not quarrel
with any explanation but the last.   Till we know more about
the subject, I submit the best thing is to remove the appendages,
and that completely, and then quarrel about how and why it
succeeds.   I have not troubled you with useless details about
the case, and may perhaps be permitted to describe Mr Tait's
way of operating.   He removes the appendages close up to the
uterus.   The pedicle needle is first passed under the round
ligament of the uterus, then backwards under the tube ; the
ovary is pulled up, and needle and ligature pushed out through
the ovarian ligament.   The whole pedicle is embraced by the
Stafford knot, and the parts removed.

    To return to our patient, I may say that I was personally
responsible for the absolute asepticity of everything in the shape
of instruments and sponges used on this occasion.   The drains
of the house had been overhauled and were in a satisfactory
condition, but the house was unfortunately placed.   It lay low

down in the valley, and a day or two after the operation a vile odour was detected, which was traced to a leaking grave beside the house. There was no difficulty about the operation, which was done on 1st November 1891. The ovaries were not adherent; one, the right, was wedged behind the uterus, but was easily extracted. Both were slightly enlarged, and one was apoplectic. I did not care to add the wholly unnecessary risk of dragging up a partly adherent uterus which might be expected to atrophy. Some bleeding at the time was checked with sponge packing, but it returned and gave trouble all day: enough at the time to make one drain, almost enough to justify reopening the abdomen. I had satisfied myself, however, that it did not come from the pedicles, and did not care to open for hæmorrhage from adhesions, a proceeding that is very rarely of any use, and would have been particularly futile in a case like this. The patient was somewhat collapsed, but rallied well. The total amount of hæmorrhage was about 10 ounces. I believe this to be dangerous loss after abdominal section, not necessarily because of the actual quantity lost, though this is serious, of course, but because it discloses a source of hæmorrhage which is considerable enough to threaten life.

Some of my friends do not agree with me in the importance I attach to this amount of post-operation hæmorrhage, but others, also of great experience, think as I do on this question. The temperature kept near the normal line. The patient did not vomit more than twice. She passed flatus; had the bowels moved the third day, in response to an enema. She took beef-tea, and subsequently gruel, well. Fifty-two hours after operation, metrostaxis commenced, and lasted some days. On the third day, too, the tube was dry, and I thought it well to withdraw it, as the patient seemed very well. I returned home, a distance of 200 miles. This distance from the case added much to the complication of treatment, since the usual attendant did not take much interest in abdominal surgery, though the devotion he displayed was most praiseworthy and helpful. On the fifth day the temperature rose to 100·8°, dropped again, and on the following day was 104°. This was reported, and I inquired as to

abdominal distension, and the result of an examination per vaginam. Replies were in the negative. There was a small stitch abscess which discharged pus that was not offensive. Some stitches were removed, and the patient relieved thereby. Once, and once only, there was vomiting; bilious: the bowels acted after enemata, and the temperature had a rise and fall which would have been more considerable but for the fact, of which I was ignorant at the time, that her attendant had put her on antifebrine, by which the temperature was masked. She took food well, slept well, complained of some pain in back and abdomen, and was rather restless. I did not consider the case, from the reports, one to occasion special anxiety, till the thirteenth of the month, when a temperature of 103° was registered, and I at once went down to see the patient. I arrived at night, and found her very ill and exhausted; the temperature was 103·2°, and she had the appearance of having been much under-reported, for she looked very like dying. She lay low in bed, on her right side, had a pulse of 140, small and running; much pain in the abdomen was complained of, and it was very hard, distended all over, especially on the left side, and tender to pressure. Superficially it was resonant, but there was too much pain to permit of closer and deeper handling, and I had to content myself with the least possible interference. The wound was dry and gaping. On examination vaginally, the posterior fornix was obliterated, and replaced by a bulging, fluctuating swelling, which extended low into the vagina. This swelling was tender to the touch, as was the uterus, which was pushed forward and to the right. I at once introduced an aspirator and withdrew over a quart of horribly offensive blood and pus from this swelling; then passed into it a Cock's trocar, and through it introduced a Chassaignac's wire drainage-tube before withdrawing the cannula. The vagina was syringed every four hours with carbolic solution, and the drainage-tube occasionally turned round to keep it free. The fœtor of the discharge continued excessive. The patient was by this time extremely ill, but was energetically supported and admirably nursed. Next morning we found her much better. The temperature had

dropped to normal, the abdomen was soft except on the left side just above Poupart's ligament, and the wound had become moist and granulating, a healthy pus flowing from it. The general condition was immensely improved, and she asked for food, and enjoyed it. Copious and offensive discharge came from the vaginal tube. The patient had slept all night. I recognised the swelling on the left as a hæmatocele in the broad ligament; but as this was not particularly tender, and as the general condition was better and the temperature improved, we left it alone to take care of itself, and were contented with the drainage of the peritoneal collection, and the nursing and feeding of the patient. She continued better; the temperature kept mostly below 100°, and the bowels acted pretty well to purgatives or enemata. On the 20th November it was reported that pus was coming, but not through the vaginal tube: this was then withdrawn. That this was a mistake was shown in the rise of temperature, and, on the 22nd, by the patient's relapse into a condition of much illness, exhaustion, pain, and some dysuria. Distension of the abdomen was noticed, and this was relieved by a turpentine enema, which moved the bowels and caused much flatus to be passed. I once more returned to the case, and found her as ill as was reported. She took food badly. No discharge came through the vaginal tube, which I replaced, and the patient could only lie on her left side. To lie on the right side or back caused great pain, and increased a then growing difficulty in breathing, which became still worse, and was accompanied by pain in the back higher up and shoulders. There was no bulging to be felt per vaginam, but the uterus was pushed to the right by a swelling in the left broad ligament. The patient's condition precluded the idea of further operative interference: it was very evident she would have died under it. We were reduced to prescribing 10 grains of calomel, and giving stimulants freely. The calomel acted like a charm. Over a pint of horrible pus was discharged through the night, and the swelling in the left side disappeared entirely. Two ounces of less offensive pus were withdrawn from the pouch of Douglas with a trocar. On November 25 we gave her mag. sulph., grains

30, every two hours till the bowels acted, which they did freely.
On the 26th she was worse again.   Temperature rose to 102·2°.
There was a rounded tender swelling above the left Poupart's liga-
ment, and per vaginam some bogginess in the left posterior fornix.
Her breathing was again embarrassed.   She had frequent rigors
and a troublesome cough.   She lay easier on the left side ; pains
struck up the right side from the pelvis to the clavicle.   There
was no abdominal dulness apart from that over the swelling on
the left.   In the chest faint râles were heard on the left, and
there was diminished resonance.   We propped her up in bed,
administered stimulants freely, poulticed the chest, and gave
another dose of calomel, grains 5.   The bowels acted; the stool
was accompanied by a flow of pus per vaginam, and next day
our patient was better again.   About 6 ounces of stinking pus
came this time.   The abdomen was less distended, and she had
slept easily for some hours.   The temperature was now 102°,
and it steadily dropped, but rose and fell irregularly till
November 30, when it was normal.   The vaginal discharge
continued pretty free.   The patient improved ; her spirits and
appetite increased.   She complained of no pain except some
down the left thigh ; and there was a daily flow of about 3
ounces of greenish pus.   The abdominal wound, I should say,
had healed up some time before this ; almost immediately after
the peritoneal hæmatocele was evacuated.   Whenever the dis-
charge grew scanty, she had a dose of Esculap water or other free
purge, which always induced a flow of pus per vaginam.   Indeed, I
am satisfied that the calomel purge prevented her dying the
night she was so bad, November 23.   Improvement was main-
tained till December 16, when the patient was put into an invalid
carriage and brought down to my house.   She bore the long
journey well, and next day I ventured to finally remove the
tube from Douglas' pouch.   On January 1, 1893, I have a note
—" Gains strength continually ; eats very well ; walks or drives
out every fine day ; to-day walked half a mile. Is troubled with
heats and flushes, followed by chills.   Slight discharge of inof-
fensive pus per vaginam.   Bowels regular."   In December of last
year, thirteen months after the operation, I found her quite well

and singularly improved in health. The abdomen was nowhere tender or thickened; the wound was firm and sound; the uterus atrophied; and cervix nipple-like. There was slight tenderness on deep pressure to the left of the cervix. She never regrets the operation, for she gains strength and weight; takes an interest in life; is able to do much parish work, and walk long distances without fatigue and with pleasure.

I must apologise for detaining you so long. I have tried to give every detail of interest at the risk of wearying you. The case was an anxious one, and there are certain problems connected with it which are, I submit, worthy of consideration. In the first place, what was the cause of the hæmatoceles? Possibly both had the same origin. I satisfied myself that the hæmorrhage did not come from the pedicles or from the abdominal wound—the latter is sometimes a confusing source of bleeding, from our modern habit of neglecting the text-book's counsel of perfection, and checking all bleeding before opening the peritoneum. Two probable sources occurred to me—one, the tearing of uterine adhesions; the other, by the puncture of veins in the broad ligament in passing the ligature through it with a sharp needle. I am quite sure that this practice is not only ill-advised but may be dangerous. Mr Greig Smith, in conversation with me, suggested that the hæmatoceles, which Mr Tait acknowledges are frequent sequelæ of his operations, may be due to his use of a sharp pedicle needle, though they may also be due to the fact that he diagnoses and acknowledges his hæmatoceles.

Mr Tait considers this contention to be manifestly absurd, for the following reasons:—1st, He does not use a sharp cutting needle; 2nd, hæmatoceles occur when no needle is used; 3rd, they occur some, often many, days after operation, as in a recent case, on the fourteenth day after the removal of a parovarian cyst, where no needle was used. I fancy, though, that the pointed needle will cause some hæmatoceles, and I have discarded it for Spencer Wells' blunt pedicle needle, or a pair of artery clips, which are pushed through the broad ligament, and used to draw the ligature through. A very small puncture will cause bleeding, drop by drop, which may in time become

considerable enough to be serious, either within or without the broad ligament, and may crown with disaster a simple operation. The pelvic vessels, again, are so accustomed to irregular engorgement that, especially in operation cases, where the subjects have a pelvic circulation which has long been distracted with disease of an inflammatory or other nature, it is not a matter of surprise that, on being subjected to the last great shock of an operation on the broad ligament, they should not be equal to it, but give way under the strain of reaction. Where tumours have been removed, vessels which have been enlarged, extended, and submitted to pressure, must feel reaction severely, as well as the alteration of their surroundings and of pressure. We must consider in this relation the nerve apparatus of the pelvis too. Of this we know, as I have said, very little. Metrostaxis following removal of the appendages and other broad ligament operations may be, as I have said elsewhere, a symptom of the irritation of this nerve element, which is probably part of the sympathetic system distributed on the vessels; or it may be that recovery from the shock of operation is accompanied by reaction which finds relief in the way in which many pelvic troubles in women are apt to find relief—by uterine hæmorrhage. And this is, I believe, the case, in spite of Dr Japp Sinclair's mechanical theory of metrostaxis, which he explains by engorgement of veins from imperfect ligation of arteries in the ligament, and inclusion of a greater proportion of veins connected with the uterus. This may be, and probably is, the cause of hæmatocele in some cases—interference with broad ligament veins and checking of metrostaxis. It may have caused hæmorrhage into the peritoneum, and into the broad ligament in my own case. A singular point here, too, is the fact that the blood must have been rapidly effused, to the extent of nearly two pints, into the peritoneum, and that, as in other hæmatoceles, bleeding ceased spontaneously.

The wound closed within a few hours of the drainage-tube being withdrawn, but not before the hæmatocele had become infected. Infection of the hæmatoma must have been much later, after evacuation of the peritoneal effusion, since all the

symptoms of fever, pain, &c., disappeared completely after that collection had been drained. Another point of interest lies in the fact that the ordinary metrostaxis was not interrupted by either the formation of the hæmatoceles, or by their subsequent infection and suppuration. Protective peritonitis prevented infection of the general peritoneum, and removal of the collections per vaginam obviated subsequent drainage through a mass of healthy intestines and peritoneum, which would have been a fatal complication under the circumstances; which any surgeon not absolutely rash must dread, however audacious he may be. The question of diagnosis comes in, of course, and some may look upon both cases as being broad ligament hæmatomata, or doubt the existence of an extra-peritoneal effusion. I am perfectly sure one such existed. The position of the swelling low down on the left, just above Poupart's ligament; its rounded, dome-shaped top; its precise limitation to the left side, pushing the uterus towards the right, if not its vaginal evacuation, strengthen the diagnosis. I did not trouble the patient with a rectal examination, but free purgation was practised with the idea, the hope, that it might help to determine the escape of the contents of the broad ligament which were tending to point downwards. It may have been another separate effusion in the peritoneum, but this is very doubtful. I freely drained the peritoneum within reach through Douglas' pouch, and that the hæmatoceles were not connected was proved by the escape of a large quantity of pus independently of that drained in this way.

<div align="center">December 9, 1893.</div>

Herpes Gestationis (concluding Note). By FRANK H. BARENDT, M.D. (Lond.), F.R.C.S. (Eng.), Pathologist to the Royal Southern Hospital, Honorary Medical Officer to St George's Hospital for Diseases of the Skin.

IN the *Liverpool Medico-Chirurgical Journal*, No. 25, July 1893, p. 466 *et seq.*, a case of herpes gestationis was recorded. The patient, Hannah W. (pregnant 8th month), was shown

(March 16, 1893) at a clinical meeting in the Liverpool Medical Institution. The eruption was polymorphic, universal, and most marked on the legs proper. I am now able to add the following details:—

Confinement took place April 18; the labour was normal, and the child perfectly healthy and free from blemish. A week before, the patient noticed that no fresh efflorescences appeared, and those previously present—vesicles, crusts, &c.— began to heal. During the first week of the puerperium she had a relapse, and then the eruption was as bad as ever; in fact, she was obliged to remain in bed longer than she had done after her other confinements. Towards the end of the second week it began to fade, and three weeks after the birth of her child she was thoroughly examined. The trunk was free from recent eruption, slight brownish-red stains alone pointed to its universal character. The forearms, legs, and ankles still showed crusts and patches of erythema figuratum; she stated, however, that they were healing rapidly. She was nursing her child, and her general health was good; her complexion was clear, and no erythematous macules or papules were visible on the face.

On December 7 the patient reported herself well, and perfectly free from any skin trouble. A slight pigmentation of the limbs—especially the shins—marked the site of the efflorescences. Her general health was excellent, and the only thing that troubled her was that she was getting stout. The child was perfectly well, and its skin was quite sound and normal.

At first sight the eruption might have been mistaken for pustular scabies, for some of the blebs showed purulent contents, and the distribution of the rash was perhaps favourable to that view. The history and the absence of the typical itching negatived the diagnosis. To some who examined the case, its polymorphism suggested syphilis as a possible alternative; on the other hand, all the children were perfectly free from any skin affection, and no facts could be elicited that might, with even a shade of probability, be interpreted in favour of a specific origin.

As regards the ætiology of herpes gestationis, two theories are

possible:—One, that it is a visible neurosis depicted, so to speak, on the skin. In that case, treatment would be of the nature of nerve tonics—nux vomica, belladonna, &c. The other, that it is the result of auto-toxicity—dermatitis auto-toxica. It is well known that the amount of urea and its antecedents are increased during pregnancy: and although the urine was examined for albumin and found to be free, still it is quite possible that the kidneys were not getting rid of the waste material properly, and this accumulating in the blood influenced the nutrition of the skin. Dietetic measures would be indicated on the latter hypothesis, and the kidneys, by means of diuretics, should be stimulated to increased action, in the hope of preventing such accumulation. Local treatment alone was used in this case, as the patient came under observation far advanced in pregnancy, and it was thought advisable to await its termination.

She has promised to report herself should pregnancy recur, and then an opportunity may be given to test the above theories.

Pathological Specimens.

December 14, 1893.

Sections of Two Cysts. By W. THELWALL THOMAS, F.R.C.S., Assistant Lecturer on Anatomy, Hon. Assistant Surgeon, Royal Infirmary, Liverpool.

1. Section of a dermoid cyst of the index-finger. The patient, a male, æt. 50 years, a brass-worker, whose palms were very rough, and each prominence on the fingers covered with hard, dry, cracked epithelium, presented himself on August 1893, on account of a rounded swelling which occupied the palmar surface of the first segment of his right index-finger.

It was painless, had been noticed for some months slowly increasing in size, and inconvenienced him by restricting flexion of the finger; it appeared to be under the skin, fluctuated, without signs of inflammation, and unconnected with the tendon sheath.

A minute puncture was made by means of a tenotomy knife, when about a drachm of thick creamy fluid oozed out; the incision was enlarged, and a cyst exposed with white walls; this was easily detached and removed.

Section shows a fibrous cyst, lined by many layers of epithelium, the deepest cells small and cubical, the superficial cells passing through the transition to cornified squamous epithelium.

It appears to be an "implantation" dermoid, probably caused by some epithelial cells having been driven downwards by his rough occupation, although he remembers no wound.

The irritation of the palmar cuticle, leading to its extensive hardening and thickening, suggests this causation.

2. Congenital cyst of the back. M. P., female, æt. 8 years, born with the "lump," which slowly grew, and latterly became painful.

July 1893.—A large cyst extended from the 5th cervical vertebra to the 5th dorsal, and projected $2\frac{1}{2}$ inches above the surrounding level; it was oval in shape, its long diameter oblique, and presented at one place a slight depression.

The cyst was translucent, under healthy skin, and measured 9 inches by 6.

There was no evidence of communication with the spinal membranes, and there had never been cord symptoms.

Removal was undertaken. The skin was easily removed by dissection; the cyst was separable from, but firmly adherent to, the origin of the trapezii in the middle line.

The spines of the vertebræ were normal.

About 15 ounces of clear serous fluid escaped. The wall was about $\frac{1}{4}$ of an inch in thickness in one place, lined by a small film of easily detachable lymph, probably evidence of recent inflammation, and on microscopic examination reveals here and there a flat endothelial cell.

Occurring as it did in the middle line at birth, meningocele and dermoid cyst suggest themselves. The lining was certainly not that of a dermoid cyst, so that this was probably a fœtal meningocele, shut off from its old communication with the spinal membranes.

New Drugs.

Liquor Sedans.

WE have received from the well-known firm of American chemists, Messrs Parke, Davis & Co., a sample of a composition to which the name of " Liquor Sedans " has been given. Each fluid ounce contains viburuum prunifolium 60 grains, hydrastis canadensis 60 grains, and piscidia erythrina 30 grains, combined with aromatics. The dose of the mixture is from one-half to one teaspoonful, and the advantages claimed for it are that it is a useful sedative in all cases of hyperæmia of the female reproductive organs. They therefore offer it to the profession, feeling certain that it will be found a convenient and serviceable combination for a large class of cases of dysmenorrhœa, ovarian irritability, and irregularity of the utero-ovarian functions.

Glycerine Suppositories.

WE have also received a sample of "glycerine aperient suppositories" from the same firm. Glycerine in the form of a rectal aperient injection is too well-known to require mention, but attempts to make glycerine up in the form of efficient suppositories has not been always successful heretofore. Each suppository contains about 46 grains of glycerine, and it is absolutely free from water. That such suppositories can be more conveniently made use of than injections goes without saying, and nothing is more likely to bring glycerine into general use as the ordinary aperient than the great handiness and simplicity of the preparation. Only one size is made. For infants and young children one-third or one-half may be made use of as required, as they can be cut quite easily.

NON QUO SED QUOMODO.

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CONTENTS.

𝔒riginal 𝔄rticles.

THE RADICAL CURE OF OTORRHŒA.[1] By HUGH E.
JONES, *Assistant-Surgeon, Liverpool Eye and Ear Infirmary,
and Assistant Ophthalmic and Aural Surgeon to the Wigan
Infirmary.*

EVERY chronic otorrhœa is probably the result of an acute
inflammation of the middle ear, which has been partly or
wholly neglected, or which, on account of the diathesis of
the patient and the virulence of the septic material, has
resisted treatment.

The causes of the acute affection are familiar to all. In
hospital out-patient practice acute suppurative otitis is com-
paratively rare, but acute catarrhal affections are common:
both these diseases, as a rule, get rapidly well under treatment.
Chronic otorrhœa, on the other hand, while forming a very
large proportion of the practice in an ear clinique, has, until
recent years, been looked upon—in the majority of cases at any
rate—as practically incurable. What I hope to do in this
paper is to show that, thanks to the great advance made
in recent years in the operative treatment of otorrhœa, nearly
all cases are capable of capable of radical cure.

[1] Portions of this paper were read, and illustrative cases shown, at the meeting
of the North Wales Branch of the Brit. Med. Assoc., April 1894.

In order to do this, and to distinguish between the curable and the incurable cases, and also between those requiring and those not requiring operation, it will be necessary to have a classification. The one I shall attempt will be partly clinical and partly pathological, and *will be confined to the genuinely chronic affections, which may exist for long periods without giving rise to any alarming symptoms.* Acute mastoid and intracranial complications command instant attention, and nowadays their operative treatment is so widely known and so generally successful that they require no further justification, and will therefore be left out of consideration in this paper.

The class into which any given case falls *when it comes under observation* depends upon a variety of circumstances, and it will perhaps be well to state these before giving the classification.

(a) The cause and severity of the original inflammation and of subsequent acute attacks.

(b) The amount of attention it received, and the duration of the chronic affection.

(c) The condition of the naso-pharynx, Eustachian tubes, and external meatus.

(d) The age of the patient, the degree of development, and the conformation of the bones.

(e) The portion of the tympanum primarily attacked (*i.e.*, whether the upper or lower parts).

(f) The constitutional condition of the patient.

When first seen, then, our case of otorrhœa having been made chronic by a combination of circumstances, will be found on examination to belong to one or other of the following classes :—

(1) Simple chronic purulent inflammation, limited to the main cavity of the tympanum, with a perforation in the lower tense portion of the membrane.

(2) The disease limited as in (1), but accompanied by formation of polypi or granulations unconnected with bone disease.

(3) On the removal of polypi or granulations from easily

accessible portions of the tympanum or external meatus, small superficial patches of caries can be made out with the probe.

(4) Chronic suppuration of the mastoid antrum.

(5) Suppuration of the portion of the tympanum known as the attic or *recessus tympanicus* (bounded by the roof of the tympanum, by the flaccid membrane of Shrapnell, and by the upper portion of the malleus and incus and their ligaments). In this variety there may be a small perforation in Shrapnell's membrane only, or this may be associated with another perforation in the lower or tense part of the membrane.

(6) Associated with (5), caries or loss of one or more ossicles.

(7) 1 and 5 may result in adhesions formed between the ossicles, or between the ossicles or membrane and the tympanic walls. These adhesions may interfere with drainage and keep up the discharge, besides causing subjective symptoms—deafness, tinnitus, and vertigo.

(8) Accumulations of epithelium in the meatus externus, tympanum, and mastoid antrum. (These masses of epithelial cells—cholesteatoma—are now regarded as new growths.)

(9) Caries of the mastoid antrum (sometimes associated with caries and perforation of the posterior wall of the external meatus), or some portion of the tympanic walls not accessible through the perforation in the membrane, but which *can be removed by operation* without grave risk.

(10) Caries or necrosis of portions of the petrous bone, which *cannot be removed by operation* without grave risk.

(11) Eburnation of the mastoid, or hyperostosis or exostosis of the tympanum or external meatus.

Strictly speaking, (1), and occasionally (5), are the only simple primary conditions, all the others being extensions or results of severe or prolonged suppuration.

Diagnosis.—It is not my intention to deal at length with the question of diagnosis, but this much may be said, that it depends

upon the character of the discharge; the presence of dull, deep-seated pain; inspection of the walls of the meatus, the tympanum and its membrane, &c.; the careful use of the probe; an accurate knowledge of the history of the case; and lastly, but by no means least, the results of treatment—that is to say, if, after thorough treatment of conditions such as 1, 2, 3, and 5, and associated affections of the naso-pharynx and external meatus, the otorrhœa continues, even in the absence of any positive diagnostic signs, it may, I think, be fairly assumed that one or more of the other conditions (viz., 4 and 6 to 11) exists.

Three methods of determining the condition of the mastoid before operation have been described, viz., transillumination by means of electric lamp in the meatus, percussion of the mastoid, and conduction of the sound of the tuning-fork when placed over the mastoid. Although I myself suggested the last method (*Brit. Med. Jour.*, ii. 93, and *Liverpool Med. Chir. Jour.*, i. 93), they all appear to me to be quite unnecessary refinements, because exploration has been made easy and safe by the recent researches in anatomy.

Prognosis.—The cases in classes (1) to (3) and some cases of class (7) are amenable to old well-known methods of treatment.

In classes (4) to (9) I am convinced, as well by personal experience as by the records of other surgeons, that while the older methods fail, it is possible, by the modern operative treatment, to bring about in healthy patients a radical cure of the otorrhœa.

In class (10), while a cure, or at any rate a rapid cure, is practically impossible, the risk to life may be very materially lessened by providing for free drainage, and by bringing the diseased bone within the field of observation and antiseptic treatment.

In class (11) the conditions are so variable, and the operative treatment so difficult, that it is impossible to make any general statement as to prognosis.

Treatment.—Before considering the treatment applicable to each class of case, it is necessary to answer a question which

naturally arises out of the statement I have ventured to make on the subject of prognosis. If such a large proportion of the cases are curable, how is it that so few of them are actually cured, while many are allowed to slide from class to class, becoming graver at each remove?

In the first place, many of the subjects of otorrhœa are either perfectly indifferent to it so long as the hearing of the other ear is good and they are free from. pain, or they are possessed by fallacious ideas on the subject—ideas which, being based upon half-truths, and probably acquired more or less directly from a deeply respected medical adviser, are not easily uprooted.

When asked why they have neglected the ear, or why they decline treatment, patients, or their parents, will say that they have been told that a discharge from the ear is of no consequence; that the discharge will stop at some specified age —will "run itself dry"; that the ear would become deaf were the discharge to be stopped; or that the discharge must on no account be stopped, lest it should turn inwards and affect the brain. It is, I am sure, quite unnecessary for me to point out here the fallacies in these statements, or to show how the germ of truth has been perverted; at the same time, I am convinced that the profession generally has not, even yet, *actively realised* the importance of warning patients of the danger they run by neglecting an otorrhœa.

In the next place, even when convinced of the danger of otorrhœa and the urgent necessity for treatment, the patient very often cannot or will not devote the time, patience, and care required for a successful termination.

In private practice there is the additional difficulty of expense; for in order to carry out thoroughly a course of antiseptic treatment, perhaps to be followed by an operation and its after-treatment, it is in many cases necessary for the surgeon to see the patient twice or three times a week, or even every day. This, however, is, I think, a difficulty which may be overcome without loss of dignity to the aural surgeon, or interfering with the interests of the practitioner who sends the case to him;

moreover, I am convinced that, in the long run, the thorough, and if necessary radical operative treatment of otorrhœa saves the patient much time, trouble, and expense.

Lastly, even the specialists of this country are a long way behind their confrères in Germany and America in the matter of insisting upon the radical treatment of the purely chronic affection. As I have already said, when acute symptoms, indicating serious complications, arise, the case is taken in hand, and thorough surgical treatment applied; but until then, it is too much the habit to be content with mild, ineffective measures. This, no doubt, is due to a desire for conservative surgery, a dislike to removal of structures which are not absolutely proved to be diseased, and a fear of increasing the deafness. The answer is, that a man may save his ossicles and lose his life; and that, so far from making the hearing worse, in the majority of cases it is improved by radical operation. Until the public opinion of the profession is brought to bear upon the lay public, there will always be some difficulty in convincing individual patients of the importance and feasibility of radical treatment. And now, in discussing the treatment, we will suppose that these preliminary difficulties are overcome, and that we are allowed *carte blanche.*

In every case the principles of treatment are the same, viz., drainage, removal of disintegrated or hypertrophied tissue and neoplasms, and antisepsis. The discussion, therefore, resolves itself into the question of how these principles may be most completely realised in each case or class of cases. In all, *the first point* to be attended to is the patency of the external auditory meatus. Throughout the course of the case this must be carefully maintained. Often, especially in children, both the discharge and the applications made to the tympanum have an irritating effect upon the skin, causing eczema, excoriations, and swelling. The *next point* is the position and size of the perforation in the membrane. If small, it should be enlarged, with the galvano-cautery or paracentesis knife, in the direction which will most favour drainage and the application of lotions, &c. Granulations and polypi, so far as they are within reach, whether

growing from the meatal wall, the membrane, ossicles, or the walls of the tympanum, must be destroyed. Large polypi may be cut through as near the base as possible with the ecraseur, or a drop of a strong solution of chromic acid may be injected into the substance of the polypus with a hypodermic syringe. For the destruction of the root and of small polypi and soft granulations which cannot be easily caught by the ecraseur, I rely entirely on solid chromic acid fused on a probe point. An attempt may also be made to cut through or break down adhesions between the ossicles or membrane and the promontory, if any such exist. The *third preliminary point* is the thorough treatment of any existing diseased or hypertrophic condition of the naso-pharynx and Eustachian tube. Without this, it is practically useless to attempt a radical cure of the otorrhœa. (If the Eustachian tube is not freely open, fluids cannot enter the tympanum from the meatus, and the assistance of inflation *per tubam* in driving out accumulated discharges is lost. Moreover, chronic inflammatory conditions of the naso-pharynx with open tubes will inevitably lead to relapses of the tympanic disease.) We are now in a position to treat the mucous membrane of the tympanum itself.

As a rule, syringing as carried out at home by the patient is very nearly, if not quite useless. In order to secure effective syringing, I direct the patient to use the fine rubber tube made by Down Bros., at the suggestion of Mr Arbuthnot Lane. This tube is pushed into the ear as far as it will go, and the nozzle of the syringe applied to its outer dilated end. · One thorough washing out *per diem* is sufficient. The lotion usually prescribed is 2 per cent. solution of boracic acid, 2 per cent. solution of carbolic acid, or 1·4000 perchloride of mercury. After syringing, the tympanum and meatus may be carefully dried with absorbent wool, and boracic acid powder blown in, or it may be filled with one of the following " drops " :

Alcohol 50 per cent., iodoform 3 per cent. : chloride of zinc 1 per cent. (to which a few drops of dilute hydrochloric acid may be added) : bicarb. of soda 2 per cent., carbolic acid 2 per cent., glycerine 10 per cent.

Fresh drops or powder should be put in three or four times a day.

After the granulations have been completely destroyed the surface from which they sprang must be examined for carious bone, and this, if discovered, should be scraped with a fine curette, and the ordinary treatment continued.

When treatment such as that described above has been exhaustively carried out for several weeks without success, it is practically certain that the case does not belong to class 1, 2, or 3. Class 5, 7, 8, and 11 are generally unmistakable from the commencement, but the remaining conditions are by no means so easily diagnosed; in fact, the diagnosis must often rest on the process of exclusion.

Suppuration of the attic may in rare cases (generally, when one or more of the ossicles have already been discharged) be overcome by antiseptic irrigation by means of one of the intra-tympanic irrigators in vogue (preferably Milligan's), or possibly by dry cleansing and application of iodoform and boracic powders; chronic suppuration of the antrum, especially when there is a sinus leading into it from the surface behind the ear or within the external meatus, may, conceivably, in rare cases be treated with success by similar methods; cholesteatoma confined to the meatus and tympanum might possibly be gradually scraped out, and superficial caries or necrosis, not within reach of the curette introduced through the membrane, may end by complete dis-charge of the debris and subsequent cicatrisation : this much we may admit; but do these methods, except in a very few cases, meet the first principles of surgical treatment, viz., perfectly free drainage, or the complete removal of the diseased tissue and the subsequent maintenance of an aseptic condition ? Results show that they do not. The alternative is radical operative treatment.

At the last meeting of the British Medical Association (New-castle, 1893), Mr Victor Horsley suggested that it would be well to lay down a rule that thorough opening of the mastoid antrum should be performed in every case of otorrhœa which had resisted ordinary treatment for twelve months. With due deference to Mr Horsley's great authority, I would submit that the fixing of

any time-limit would be productive of more harm than good; because, on the one hand, many cases are ripe for operation the day they come under the aural surgeon's care, and on the other hand, any such limit would encourage laxity in the determination of the exact variety and extent of the disease, with the result that all cases would be treated very much alike, both during the twelvemonth's probation and afterwards.

The Radical Operations.

1. *Excision of the ossicles and tympanic membrane through the external meatus.*—It is only where the mischief is confined to the tympanum that this operation can be regarded as radical. It is specially indicated in cases of attic suppuration with caries of the ossicles, and in cases of partial cicatrisation, with matting together of the structures within the tympanum, resulting in great deafness, tinnitus, or vertigo (*i.e.*, classes 5, 6, and 7).

It is not to be supposed that removal of the ossicles in itself necessarily effects a cure. The treatment of granulations, carious patches in the tympanic walls, and the altered mucous membrane, must be persisted in as before. (The same remark applies to the other operations.)

The advantages of this operation are, that it does not involve any skin wound or chiselling of bone, and is therefore less alarming to the patient than the ones about to be described: there is no long healing process, with possibly painful dressings; and it is entirely free from special risk. The disadvantages are, that it is difficult to perform; requires an exceptionally powerful light and special instruments; is only possible where the external meatus is roomy; and, finally, it leaves the *cul-de-sac* of the antrum unexplored, and, as some authorities assert, out of the range of treatment.

2. *Stacke's Operation.*—This originally consisted in making an incision along the posterior attachment of the auricle, turning the latter along with the soft parts of the meatus forwards, and then excising the membrana tympani and ossicles; but to this Stacke soon added the removal of the upper portion of the

posterior wall of the osseous meatus, thereby converting the mastoid antrum, tympanum, and external meatus into one cavity.

3. *Free opening and ablation of the mastoid antrum (antrectomy) from the outer surface of the mastoid bone, with or without extraction of the ossicles through the same opening.*—This is merely an extension of the original operation for drilling or trephining the mastoid. It has been brought to perfection by Macewen, who has shown that the dental burr driven by a powerful motor is the most efficient and safest instrument to use (*v.* " Pyogenic affections of the brain and spinal cord ").

4. *The Stacke-Schwartze Operation.*—Under this name Dr Holmes has described in the *Arch. of Otology,* Oct. 1893, an operation which has probably suggested itself to most men who have performed Stacke's operation. It simply consists in the combination of methods 2 and 3.

Having come to the conclusion that the last (4) is the best operation, I shall give a detailed description of that one only.

Before doing so it is necessary to point out two or three facts in the anatomy of the part to be operated on. Up to the end of the first year of life the temporal bone consists of three easily separable parts,—the squamo-zygomatic, the petro-mastoid, and the tympanic. Grüber has shown that the tympanum and mastoid (or petro-mastoid) antrum are formed by the closing in of a *sulcus* on the antero-external aspect of the petro-mastoid bone by the squamo-zygomatic (its horizontal portion) and tympanic bones. The inner lamella of the squama forms the roof or " tegmen " of the tympanum and antrum, and the outer lamella forms by its anterior part the upper half of the osseous meatus, and by its posterior wedge-like part the outer wall of the antrum and a considerable triangular portion of the surface of what is usually called " the mastoid." The suture between the outer lamella of the squama and the true mastoid can be seen, even in fully developed bones, crossing the surface obliquely from the posterior end of the posterior root of the zygoma to the lower border of the meatus. It follows from this that the petro-mastoid bone does not enter into the formation of the external meatus, and only forms the internal and posterior walls

and a part of the roof and floor of the tympanum and antrum. There is another fact which, so far as I am aware, has not been pointed out before now, viz., that the facial canal and the groove for the sigmoid sinus are confined to the petro-mastoid bone. The surgical importance of this is that the whole of the external covering of the tympanum, with its attic, and the mastoid antrum, *i.e.*, the whole of that portion of the squamo-zygomatic bone described above, can be removed (subject to certain pathological changes to be mentioned later on) without interfering with either the nerve or the sinus. At the junction of the superior with the posterior border of the meatus (osseous) will be usually found a small crest of bone, the spina-supra-meatum, and behind this a depression. These occupy what Macewen describes, for surgical purposes, as the supra-meatal triangle, and form valuable land-marks.

The supra-meatal triangle is bounded by the linea temporalis (or posterior root of the zygoma) above, the posterior border of the meatus and a line joining the middle of this border with the upper end of the squamo-mastoideal suture. This area has been shown by several anatomists and aural surgeons to be the one place on the mastoid surface from which the antrum can be opened without risk. The next point to be considered is the depth to which the bone may be safely penetrated.

All measurements must be taken from the spina-supra-meatum.

The antrum is usually reached in from 12 to 15 mm. (unless much enlarged); the drum membrane in 15 mm.; the inner wall of the antrum, with the horizontal semicircular canal, in 16 mm.; and the inner wall of the tympanum (foramen ovale) in 20 mm. to 22 mm. (Holmes).

Average measurements cannot be absolutely relied on in a particular case, and it is best to measure the distance from the spina to the drum membrane before commencing to remove bone. The last point of importance in the anatomy is the position of the " aditus " (or short canal connecting the attic and antrum), and its relation to the facial canal. The former lies above the level of the short process of the malleus, and the latter reaches as high as the middle of the posterior wall of the meatus,

then passes under the aditus to reach the inner wall of the tympanum.

Description of the Operation.—As I was first induced, after giving up Stacke's operation, to the performance of this operation in the place of antrectomy by Dr Holme's excellent paper, what I have to say will, with one or two differences suggested by my own experience, naturally follow his account of the operation.

1. Antisepsis—as perfect as possible—is insisted upon. This operation, when performed in a chronic otorrhœa without any urgent symptoms, is a matter of expediency rather than of absolute necessity, so that the extension of the existing mischief must be very closely guarded against.

2. Incision. Holmes directs this to be made a few millimetres behind the attachment of the auricle. I prefer to make it *at* the attachment, because the landmarks in the bone are more easily found and the subsequent scar is less conspicuous. Commencing at the *highest point* of the attachment of the auricle behind, the incision follows the concha closely, until the latter bends forwards, and then passes downwards and slightly backwards to the middle of the mastoid *process.* All the soft parts, including the periosteum, should be divided thoroughly in the whole length of the incision. Elevate the periosteum forwards into the external meatus and backwards over the supra-meatal triangle. This exposes the postero-superior margin of the meatus and the supra-meatal spine. Pull the auricle well forwards and downwards, and separate the lining of the meatus right up to the drum, so that the upper posterior part of the latter can be felt with the probe and seen. It saves much time to get all the cutting and tearing done and the bleeding stopped before anything further is attempted. Retractors are now to be applied.

3. In the absence of a burr and motor, the best instrument, in my opinion, for making the preliminary opening into the antrum is a wide-angled drill-shaped instrument used like a trephine, *i.e.* with half turns. The point should be applied at a spot close behind and above the supra-meatal spine, and

worked in a direction horizontally inwards and forwards (*i.e.*, parallel to the postero-superior angle of the meatus). The opening can be widened from time to time, if the bone is soft, with a sharp spoon; if hard, with chisel and mallet. As the depth increases, the cavity must not be enlarged downwards. If the bone is "pneumatic," several cells will probably be opened up before the true antrum is reached. Where the bone is "diploëtic" or sclerosed, the antrum is usually small; and it is advisable to take measurements and bearings frequently (*vide supra*—anatomy).

We know that the antrum is reached by its hard inner wall sloping forwards and inwards, along which a bent probe can be passed into the attic, and by its distance from the supra-meatal spine. (Caution.—For the first quarter-inch of the bone-cutting, the thing to be avoided is opening the sigmoid groove; for the next quarter, the middle fossa of the skull; and the final eighth or quarter, the facial nerve and the inner wall of the antrum, with the horizontal semicircular canal.)

So far the description serves as well for "antrectomy," but now the paths diverge.

4. A bent probe should be passed through the antrum into the tympanum, and held in position by an assistant.

Cut away, with great care, with chisel and mallet, the wedge of bone between the cavity made and the meatus. At its outer end the whole of the posterior wall of the meatus may be removed, but when the inner third is reached the cutting must be sloped upwards over the dense bone covering the facial canal, so that more of the superior than of the posterior wall is removed. At the insertion of the membrana tympani the whole of the upper wall should be shaved off, so as to open up the attic freely. The last portion of the bridge (forming the actual outer wall of the aditus) is very hard and brittle, and gives way with a crack. In one of my cases the whole bone was sclerosed and of almost ivory hardness. The cutting through of this bridge caused a fracture of the wall of the facial canal, with injury to the nerve, from which recovery has, so far, been only partial. This is the condition to which

I referred in the anatomical section. Usually there is a marked difference in hardness between the wall of the facial canal and the surrounding bone; but where extreme sclerosis has taken place this distinction is lost, and the danger of direct injury and fracture correspondingly increased. After this unfortunate experience, I would strongly recommend simple antrectomy where the bone is very hard, and the burr and motor are not available. Another source of danger to the facial nerve in all operations about the antrum and tympanum is the existence of a gap or gaps in the wall of the canal, either congenital or as a result of caries. Probes and curettes must on this account be used with great gentleness in the neighbourhood of the " aditus."

5. Removal of the membrane and ossicles. The incus is easily seen and reached. Often it is found to be nearly or quite loose; if so, it can be removed with a pair of forceps; if not, divide its articulation with the stapes with a narrow knife. Pass a blunt-pointed knife around the circumference of the membrane, seize the malleus with a pair of forceps, and a few touches with the blunt-pointed knife will allow it to be drawn out. Removal of the stapes causes symptoms of the " Meniére type," and may lead to suppuration in the vestibule. It is therefore not advisable to interfere with that bone unless it is obviously carious or detached.

6. Final stage of the operation. Examine the cavities for and remove with the curette all granulations, epithelial masses, and all patches of carious bone, paying due heed to their relation to the sigmoid sinus, the labyrinth, the jugular fossa, the facial canal, the carotid canal, and the middle fossa of the skull. Split the lining of the meatus along its postero-superior angle, from its inner end to the concha, at which point make a transverse cut. When bleeding has stopped, apply iodoform and boracic powder freely to the whole surface of the cavity; close up the external incision by means of three or four sutures; pack the whole cavity through the external meatus with one long narrow strip of iodoform gauze.

Subsequent treatment. In the absence of pain, rise of tem-

perature, or other sign of suppuration, the first packing may be left for a week or even longer (Macewen has left the dressing in antrectomy for a fortnight). The sutures may also be left, unless causing irritation. In the event of suppuration, the packing must be removed, the cavity irrigated with some antiseptic lotion, dried, dusted with boracic acid, and repacked every day. Granulations, if exuberant, should be touched with chromic acid. Cicatrisation, if all diseased part has been removed, takes place in from four to eight weeks. The healing of the external wound is usually complete in a week or ten days. Where it is not possible to remove all the diseased bone (class 10), the treatment must be conducted as before the operation, but with this advantage, that now the disease is probably within reach of antiseptic drops and lotions, and can be inspected. If the meatus is not thought sufficient for drainage, the mastoid wound can easily be reopened and a permanent fistula made.

The indications for simple excision of the ossicles have been pointed out: it now remains to compare the advantages of the three radical operations. After performing Stacke's operation twice, I gave it up in favour of Schwartze's modification, because the latter is more easily performed, and, I think, with less danger to the facial nerve and the inner wall of the tympanum.[1]

The advantages of both these operations over antrectomy are, that the removal of the ossicles is made easier by the former; the skin wound can in most cases be closed at once, whereas in the latter it has to be kept open for weeks, if not to be made permanent; in the former, the attic is more fully exposed and the meatus permanently enlarged. Antrectomy should, I think, be reserved for acute cases, to be converted at a later date into a Stacke-Schwartze, and for cases of sclerosis such as the one described above.

There remains one class of case to which I have only referred

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[1] I have done the Stacke-Schwartze operation in eight cases, with the following result:—Complete cessation of discharge, 5. Doing well, but too recent to state result, 2. The remaining case was the one of extreme sclerosis described above. My own experience of antrectomy has been that recurrence takes place in a large proportion of cases, unless the opening in the mastoid surface is made permanent.

incidentally, viz., class 11,—sclerosis, hyperostosis, exostosis. I am inclined to think that unless there are urgent symptoms pointing to caries at some point beyond the dense bone, or unless hyperostosis or an exostosis is seriously narrowing the external meatus, and so penning up the discharge, it is wisest not to attempt a radical operation; and if it should be necessary to do anything, it ought to be done with a burr, after Macewen's method. Excision of the ossicles, if they could be reached, would probably facilitate drainage and treatment, supposing it was inadvisable to attempt a radical operation.

To sum up, our 11 classes of cases may be grouped as follows:—Classes 1, 2, and 3 usually yield to thorough application of the older methods of treatment; 5, 6, and 7 may be treated, with almost the certainty of cure, by excision of the ossicles or by the Stacke-Schwartze operation; 4, 8, and 9 cannot be cured in the majority of cases by simple excision of the ossicles, but generally are by the Stacke-Schwartze operation; 10 requires the Stacke-Schwartze operation or antrectomy. Cure will in any case be slow, and in some will not result at all; and 11 had better be left alone, unless urgent symptoms arise.

Whatever that of the reader may be, my own conclusion is, that it is the duty of every member of the profession, and more especially of every aural surgeon, to every patient under his care who is the subject of chronic otorrhœa, to advise thorough treatment on some such plan as I have described; and that, in a very large majority of the cases, the result of such treatment would be complete cure.

THE TREATMENT OF CROOKED LEGS IN CHILDREN.

By R. W. MURRAY, F.R.C.S., *Surgeon, Children's Infirmary, Liverpool.*[1]

RICKETS is such a common affection amongst children in a large town like Liverpool, and crooked legs, the result of rickets, so well known to everybody, that I thought it might be of some interest to relate to you the results of our experience at the Children's Infirmary respecting the treatment of these deformities. Before speaking of the treatment of crooked legs, I propose making a few remarks upon rickets as a general disease, emphasising more especially those points in its causation that have some direct bearing upon its treatment.

The medical history of rickets may be said to date from the writings of Glisson in the seventeenth century, though the disease, or, to speak more correctly, the deformities resulting from the disease, were certainly known before this; still, credit must be given to Glisson for being the first to write anything like a treatise upon the subject.

Owing, no doubt, to the increasing population of our cities, the increasing struggle for existence, necessitating the employment of women in many industrial pursuits, and the consequent necessity of their children being brought up on the bottle rather than on the breast, rickets is a much more common disease now than it was when Glisson wrote ; and though we are all agreed as to the symptoms and general treatment of the disease, opinion is by no means unanimous as to its etiology.   Whether rickets is hereditary or not is a question that has excited a good deal of discussion.   But rickets is certainly not hereditary in the sense that phthisis is hereditary ; and, as Mr Hutchinson has remarked, "a disease which in the true sense is hereditary ought to be derivable from either parent, but it is clearly possible that rickets may not be so."

That rickets may be present at birth there can be no doubt,

[1] Read at Liverpool Medical Institution, February 1, 1894.

for fœtal bones have been examined which presented distinctly rickety changes, and quite recently I saw a child of four months who was markedly rickety, including such signs as beading of the ribs and curving of the tibiæ. Now this child had been fed almost entirely upon the breast; and in order for the bones at the age of four months to have undergone such real alteration in their nutrition and chemical composition, it seems to me almost certain that the disease in this instance must have been congenital. But I am strongly of opinion that in the vast majority of cases rickets is not in the ordinary sense of the term congenital, but an acquired disease, appearing usually during the first year of life; and if it be present at birth, the impoverished condition of the mother's blood bears the same causal relation to the disease as improper food and imperfect sanitary surroundings do after birth.

The geographical distribution of rickets brings out some interesting facts; and although we in England are accustomed to attribute improper feeding as being *the* cause of rickets, impure air and insufficient sunlight being regarded as accessory factors, there is abundant evidence to prove that pure air and plenty of sunlight are very powerful agents, not only in preventing, but in curing rickets.

Waritz, writing from Java, says that children brought out to Java from Europe suffering from rickets recover from the malady in a few months without the aid of any medicinal remedies. And, according to Macnamara, rickets is quite unknown among the children of the poorer natives of India; and " when it does occur in the children of soldiers, it is in damp districts, where the children are confined in huts."

Rickets is a well-recognised disease among the lower animals; and Mr William Williams, the well-known Veterinary Surgeon of Edinburgh, in his work on Veterinary Surgery, says," Young animals fed upon artificial foods in lieu of milk, and kept without exercise, or when placed under any condition which interferes with those natural functions peculiar to youth, may become rickety,"—the soft bones bending under the weight of the animal just as they do in the human subject.

In speaking of treatment, he advises the constant companion-ship of the mother, emphasises the importance of pure and dry air, and strongly recommends cod-liver oil and iron.

There are many other interesting points in the study of this disease,—for instance, the relationship, if any, between rickets and congenital syphilis, and the relationship of rickets to tuber-culosis; and in connection with the latter, I may say that I find it very unusual for a child suffering from rickets to, at the same time, show any evidence of tuberculosis, such as a pulpy knee, disease of the spine, or hip-disease. But I must now pass on to the main theme of my paper, namely, the treatment of rickety deformities of the lower limbs.

I wish it to be clearly understood that my remarks will refer only to the treatment of crooked legs occurring in quite young children,—that is to say, in children under four years of age, and to those a few years older, who are markedly rickety. In the older children, I correct the deformities by doing a simple osteotomy, or by taking a wedge-shaped piece out of the tibiæ. I will not burden you with a criticism of the numerous explana-tions that have been advanced as to why in one case the tibiæ curve outwards, in another inwards, and in a third knock-knee results; and will only remind you that the extreme deformities one sometimes sees in very rickety children about four or five years of age, and who have only just commenced to walk, their legs resembling corkscrews more than anything else, are un-doubtedly due to the way in which the child has been accustomed to sit, with the legs tucked away in tailor fashion. And if you place the child on the floor, it will assume this position, and so demonstrate to you how it made its legs crooked. I had an admirable example of this in the out-patient room a few days ago, and much regret I did not have a photograph of the child taken, to show you this evening.

Ninety years ago, surgeons fully appreciated the difficulties connected with the mechanical treatment of crooked legs; and Boyer, writing very early in this century, says, that "Notwith-standing the praises which have been bestowed on mechanical means by their inventors, and even by respectable authors, they

are not now used by any enlightened judicious practitioners, it
being generally agreed that it is best to leave to nature alone,
aided by good medicinal treatment, the duty of rectifying the
bones deformed by the rickets."

Now, a very large proportion of the children treated as out-
patients at the Children's Infirmary are rickety; and up to the
year 1888, if a mother brought her child to be treated for bow-
leg or knock-knee, the treatment adopted was that which, I take
it, is still most generally practised, namely, suitable splints were
applied projecting well below the feet, so as to prevent the child
from walking, and to gradually straighten its legs,—the rickets,
of course, at the same time being treated generally.   The results
obtained were on the whole fairly satisfactory, but only fairly
satisfactory, for it is a very easy matter to apply splints and tell
the mother to keep the child off its feet, but quite another thing
for the mother to carry out these instructions.   The children
are usually in good health, and strongly resent being kept off
their feet: the mother, no doubt, does her best; but at the end of
a month or so, not seeing any marked improvement in the state
of the legs, she loses heart, and the treatment is not carried out
as rigidly as one would wish.

In 1888 the late Mr Rhinallt Pughe, appreciating these diffi-
culties, introduced at the Children's Infirmary a more radical
method of treatment.   Instead of attempting to gradually
straighten the legs with splints, he put the child under chloro-
form, and immediately corrected the deformity by bending the
bones straight with his hands, producing a green-stick fracture
at the maximum point of the curve, and then applied splints.
These were removed next day, and plaster of Paris substituted;
this was taken off at the end of eight weeks, the child kept off
its feet for two weeks longer, and then allowed to walk,—con-
stitutional treatment being, of course, carried out at the same
time.   The results were most satisfactory; and I think I am
justified in saying that, as a consequence, there has of recent
years been a large increase in the number of children brought
to the Infirmary to have their legs straightened, as the following
figures taken from the records of the Hospital will show.

In 1888 Mr Pughe straightened 30 legs, and in 1893 I straightened 311; the total number since 1888 being 641.

These numbers include, besides knock-knee and bow legs, a somewhat peculiar but by no means uncommon rickety deformity, which very seriously interferes with the child walking, and for which I have with great advantage performed osteoclasis of the lower end of the femur: I refer to a rotation outwards of both lower limbs, so that, when the child is lying on its back, the patella, instead of looking forwards and outwards, looks directly outwards, and the foot, instead of resting on the heel, rests on the whole of the outer border.

You are probably surprised that such a number of mothers could be persuaded to have their children's legs broken, and a large proportion no doubt would if the question was put to them in that way; and you may perhaps accuse me of not acting in accordance with strict moral rectitude; but the way in which I put it to the mothers is usually the following :—

Your child is suffering from what is called the rickets,—that means, the bones are soft, and the legs are bending, crooked, under its weight; now, the more it walks upon them the worse they will get, and the sooner they are put straight the better. The bones are so soft that the child's weight has bent them crooked. I can bend them straight with my hands, and put them in splints; and if you go into the other room I will come in and do it for you. Occasionally they ask if the legs are to be broken; then I have to explain the nature of a green-stick fracture, and they are satisfied.

Though osteoclasis for rickety deformities is by no means a novel method of treatment, and was practised somewhat extensively in France and Germany fifty years ago, still, so far as I can learn, it was practised on children somewhat older than those whose cases I have related to you this evening, and the bones were broken by means of some form of osteoclast, and not by the hands alone; in fact, osteoclasis was substituted for osteotomy, rather than substituted, as I have done, for splints.

Many surgeons in England, I believe, practise osteoclasis in cases of curved tibiæ, but comparatively few do so in cases of

knock-knee; the objection, it is said, being, that in forcibly
straightening a knock-knee you produce a separation of the
lower epiphysis of the femur, and so interfere with the subsequent
growth of the limb. And in a recent and deservedly popular work
on diseases of children, the practice is condemned in the strongest
terms. Now, I have on several occasions forcibly straightened
a knock-knee on one side only, and examined the children care-
fully eighteen months afterwards, and found absolutely no
difference in the length of the limbs. And further, I have
made it a rule to examine carefully at the time of operation
for the seat of fracture, and almost invariably find that it takes
place at the point where the lower end of the femur joins the
shaft, and quite an inch above the epiphysial line. Rickety bones,
while soft, can be readily fractured at the exact point at which
you wish to break them, and are easily moulded into good posi-
tion : even the anterior curvatures of the lower end of the tibiæ
can be thus straightened : and further, by straightening the soft
and growing bones, one does a great deal to obviate the necessity
of performing the more serious operations of osteotomy, and the
taking out of wedge-shaped pieces of bone in later childhood.
Again,—and I take this to be a matter of considerable importance,
—in gradually straightening a knock-knee with splints, there is a
great tendency for the ligaments to yield as well as the bones, a
flail-like knee-joint resulting, whereas in osteoclasis the bone
alone gives way. My hands are the only osteoclasts I have ever
used, and there are one or two practical points worth bearing in
mind in thus performing osteoclasis.

First of all, as regards curved tibiæ, if it is a simple lateral
curve, to break the bone at the point of its greatest convexity,
one should not attempt to break it as one would a stick, but
grasping the limb (say it is the right leg) firmly with the left
hand at the point at which you wish to break it, and keeping
the left hand perfectly steady, using the thumb as a fulcrum,
slowly correct the deformity with the right hand until the
bone is fractured. It is important that the bone should be
fractured and not merely bent; for if the bone be merely bent
straight, and not broken, and a splint applied, the tendency of

the bent bone to resume its former position is so great that the bandages become tight and the foot swells or the child's delicate skin blisters at the points where the splint presses. In an anterior curvature of the tibia I fracture the bone literally, and then immediately mould the limb into good position and apply a back splint with a foot-piece, it being sometimes necessary in these cases to at the same time divide the tendo-Achillis. In forcibly straightening a knock-knee (say on the right side) I grasp the thigh firmly with my left hand about two inches above the patella, using my index finger, supported by my other fingers, as a fulcrum, and holding the thigh perfectly steady with this hand, gradually straighten the limb, the knee-joint being kept over-extended the whole time.

There is no doubt that in children of three or four years of age considerable force is sometimes necessary, but it is not entirely a question of strength—there is some little knack in doing it; for I have known house-surgeons who were much stronger men than I am fail where I succeeded; and I can much more easily straighten legs now than I could three years ago.

I have ventured to bring the above facts before your notice, not because I for one moment consider that in doing so I am advocating any very novel surgical procedure, but merely because at a hospital with a large out-patient and in-patient practice, one can in a comparatively short time collect a series of cases of some particular disease, and I think learn some very important lessons by doing so. And in conclusion, Gentlemen, I would submit that the immediate straightening of rickety deformities is a more rational mode of treatment than the more gradual method by splints alone ; for not only is it absolutely free from risk,—there has been no single mishap in the whole of my series of cases,—but it also in the long run diminishes the amount of suffering, and enables the children to be running about with straight legs months before they otherwise would be.

Mr RAWDON.—During the time I was surgeon to the Infirmary for Children I performed a considerable number of subcutaneous osteotomies (with antiseptic precautions) on deformities of the

bones of the legs, consequent upon rickets. Sometimes I used the saw and sometimes the chisel. No mishap occurred in any of my cases, and the deformities were thoroughly overcome.

In a large number of cases of rickety distortion I deferred interference, lest after straightening, the deformity might relapse, and become even worse, should the attempt be made while the disease of rickets was still present, more or less active.

Lately, at the Royal Southern Hospital, I have had cases of curvature of the tibia and fibula where osteoclasis was readily accomplished by hand alone. In others, where the bones were too tough for the hand method, the osteoclast invented by the late Mr Owen Thomas proved most effective, and the results attained were particularly satisfactory.

Mr RUSHTON PARKER thought that Mr Murray had done well to adopt the simple fracturing or forcible straightening of children's crooked legs and thighs. He had himself employed this method for some sixteen years, forcing the bones with his hands when this was practicable, and at others breaking the limbs across his own knee. In the case of more resisting bones he had resorted to osteotomy, but he had never removed wedges of bone, and considered mere section quite sufficient in any case.

Some cases of knock-knee seemed to be due to a twist and curve of the femur; and in the few cases in which Mr Parker had brought about simple fracture for this deformity, he had fixed the knee-joint with padded sheet-iron splints, and broken across the femur where convenient, using the stiffened length of limb below as a powerful lever for this end. When the twist was great, he had rotated the leg and lower portion of thigh on the upper thigh, and so corrected the deformity.

Mr ROBERT JONES drew a distinction between the treatment of hospital and private patients. It was very rarely that, in private, patients were willing to encourage osteoclasm or osteotomy where simpler methods would suffice. When

splints were condemned, it was often due to the fact that
inefficient appliances were adopted: in knock-knee, for in-
stance, the long wooden splints so generally used were clumsy
in the extreme. Supports should be encouraged, which should
run into the heel of the boot, and not extend above the groin,
and a movable hinge at the knee should be deprecated. Osteo-
clasm, both manual and instrumental, had been in vogue for a
great number of years, but it was necessary that the patient's
limb should be supported for some months, whatever method of
treatment was adopted. The test of recovery after gradual
reduction was the absence of lateral movement in the joint;
and if this were patiently waited for, we would hear nothing
of flail-joints. Mr Jones advocated osteoclasm for bow-legs
and anterior curves of tibia, although it was necessary in the
latter deformity to overcome, by a second use of the osteoclast,
the anterior tibial prominence.

Mr THELWALL THOMAS alluded to the extreme prevalence of
rickets in Glasgow, where many theories were put forward to
explain it. He always performs osteoclasis for bow-legs. When
the hands fail, he uses Thomas' osteoclast, which does its work so
quickly and well. He avoids osteoclasis in knock-knee, being
afraid lest separation of the epiphysis (which can be produced
so easily on the cadaver) will be brought about, preferring
osteotomy, and insists on general treatment for the diathesis,
and wearing some apparatus for *six months* after the operation,
to prevent recurrence.

LARYNGEAL PARALYSIS. By W. Permewan, M.D. (Lond.), F.R.C.S. (Eng.).[1]

I PROPOSE to give a short account of a discovery which has, in the past twelve years, simplified and rendered more intelligible the facts and meaning of laryngeal paralysis. It has not yet been accepted as indubitable in the text-books of general medicine, and, in fact, it is not quite universally regarded as true by specialists in laryngology, so that I have thought a summary of the case might possibly be of interest to general as well as special physicians and surgeons. Before 1880 paralyses of the different laryngeal muscles were described with great accuracy, and the general relation of these paralyses to the affection which produced them were more or less clearly stated. It was, however, reserved for two clinicians, one in England and the other in Germany, almost simultaneously, to hit on a great truth which distinguished two cases of paralyses in the larynx, viz., the organic and the functional in their symptoms, appearances, and pathological and clinical import.

The whole of the muscles of the larynx can be divided physiologically into two groups, viz., those which abduct the cords from one another, and those which adduct them towards one another—the abductors and the adductors. The abductors are the posterior crico-arytenoids—or, more shortly, the postici. The adductors consist of the other muscles which act on the cords, viz., the lateral crico-arytenoids, the thyro-arytenoids, and the arytenoideus proprius. Thus it is clear that the adductors are many and strong, the abductor is single and weak. Now, of course, paralysis of the abductor will result in a state of things where the corresponding cord is more or less in the middle line of the larynx, and cannot be moved outward from that position; on the other hand, paralysis of the adductors

[1] Read at the Liverpool Medical Institution, February 15, 1894.

will leave the cords away from the middle line, to which they cannot be brought. In the first case, on laryngeal inspection, you see a cord in the middle line ; in the second, the cords are separated and cannot be brought together.

For years before 1880 it had been observed that pressure, by a tumour or aneurism, on the recurrent laryngeal, the motor nerve of the larynx, was apt to result in complete paralysis of the corresponding cord ; and, in fact, a motionless cord is commonly seen in these cases, and is a valuable sign of serious thoracic or other disease. At length it struck two observers that in cases of this kind, if seen early, the cord was often to be found at or near the middle line ; and that, while it could be adducted completely, so as to meet its fellow, it could not be moved outwards in the smallest degree. There was, in fact, abductor, but not adductor paralysis. Extended observation only served to confirm this fact ; and at length Rosenbach of Breslau, one of these laryngologists, stated this fact in the following words :— " Especially must the fact be insisted on, that in compression of the recurrent nerve, the function of the abductors first suffers, and that it is only later that the adductors become affected." At or about the same time, in a preface to Mackenzie's Work on The Throat, Felix Sémon enunciated his conclusions on this point in three propositions, which, as they have since become famous, I will here quote :—

" 1. That, in the most diverse organic affections of the centres or trunks of the laryngeal nerves, marked abductor paralysis occurs either as an isolated phenomenon, or, at least, earlier than adductor paralysis.

" 2. That no case had up to then been recorded in which a primary organic affection of the brain or nerves had given rise to an isolated paralysis of the adductors.

" 3. That, on the contrary, in functional, as distinguished from organic cases, there is a greater tendency of the adductors to be exclusively affected."

These statements of Sémon have been abundantly confirmed by observation since that time ; and it would seem strange

that the fact had not been clearly seen from the very first time that the laryngoscope came into general use. The explanation is, however, to be sought in the facts relating to the history and symptoms of paralysis of the abductor of the cords, and I will therefore quote from Burger's work on the subject, a resumé of the clinical history of abductor paralysis :—

"The posterior crico-arytenoid forms the only abductor of the vocal cord. Any interference with its function has as its result, at first, only a defect in abduction of the cord. This defect can only be established laryngoscopically. If the paralysis is complete, the affected cord cannot be abducted beyond the position of rest—the cadaveric position, which is about two and a half millimetres outside the middle line.

"Whilst now abduction beyond this position is destroyed, phonation remains almost entirely undisturbed. As regards the other function of the larynx—the respiratory—in unilateral paralysis, this function is, as a rule, unaffected, in bilateral paralysis only when heightened demands are made on breathing. For normal quiet breathing the cadaveric portion of the glottis suffices. From this description it follows that even complete bilateral abductor paralysis may be quite latent, and may be quite unexpectedly discovered by an accidental examination of the larynx. This condition of things, however, cannot remain permanent. If the action of the posticus remains absent, necessarily, sooner or later, a secondary contraction of its antagonists must develop, and result in the bringing the cord completely to the middle line. In unilateral cases, the cord may be brought to the mid-line without this process giving rise to any particular symptoms. In bilateral paralysis, on the contrary, it depends on the degree of this contracture, as well as on the demands that are made on the breathing, whether the signs of laryngeal stenosis make themselves more or less clearly manifest. If the secondary contracture of the adductors is marked, then there develop the characteristic train of symptoms of this disease, which, according to Riegel, can be recognised even without the laryngoscope, viz., marked,

exclusively inspiratory dyspnœa; stridor, most intense during sleep, and phonation almost normal.

"Laryngoscopically, one finds in such cases mid-position of the vocal cords and rhythmic slight movement of *ad*-duction on forced inspiration. As already said, in the early stage of the disease, disturbances of breathing may only occur when unaccustomed demands are made on respiration. But even without such unaccustomed demands, disturbances of breathing of a very alarming character may develop, namely, attacks of spasm of the glottis, particularly as the result of some catarrh of the larynx. These attacks are not uncommon in this disease."

From this description it will follow that paralysis of the postici, as a rule, produces no symptoms during its slow development, and is either not discovered at all, or only accidentally. In practice, therefore, one most frequently finds paralysis of the abductors together with spasm of the adductors.

From this account it is quite clear that paralysis of the abductor of the cords, or at least of one cord, may exist for some considerable time without making its presence known by any particular symptoms. This fact lends importance to the laryngeal examination of cases where organic disease is suspected, because by it the first undoubted proof of the existence of the disease may be apparent, and it also gives an explanation of the reason that Semon and Rosenbach's observations had not been made before this time. The fact is, that it is only when the paralysis of abduction has been succeeded by paralysis of adduction that attention is drawn to the larynx by alterations in the voice which then first occur, and thus, as Burger says, abductor paralysis of one or both cords may exist unsuspected till some accidental circumstance reveals its existence. Consequently, the first result of pressure on the recurrent or vagus nerve is not always observed, and the *complete* paralysis, which is only a secondary effect, is the first change to be noticed.

Since Semon's theory was first published, numberless observations have been made which support it, but no single case has been recorded in which the converse effect has occurred. On the contrary, experience has shown not only that the postici are

the first muscles to be affected in organic disease implicating the nervous trunks, but that the laryngeal muscles may be arranged in a series, according to their relative liability to become paralysed. Cases have been recorded by Semon in which he has watched the gradual spread of paralysis from the posterior crico-arytenoid, first to the internal thyro-arytenoids, and then to the lateral crico-arytenoids, and finally to the arytenoideus proprius. Conversely, too, cases have been seen in which, on recovery from complete recurrent paralysis, the adductors are the first to recover, and only subsequently, if at all, the abductors. The result of this partial recovery, by the way, is that the urgent symptoms which attend abductor paralysis when bilateral—viz., the suffocative attacks, &c.—return, which were absent when the adductors were also paralysed, and thus the last state of that man is worse than the first. From all these facts Semon has proclaimed that the abductors have a special proclivity to become paralysed in all organic disease, and it is therefore an interesting question to inquire what is the cause of this proclivity, which has, as for as I know, no parallel in the rest of the body, and which has such an important bearing on the physiological and pathological status of the laryngeal muscles generally, as well as to the relation of this paralysis to the diagnosis of the disease which produces it.

It is quite impracticable, within the limits of a short paper, as this must be, to give anything like a complete account of the various answers which have been given to these questions, and I can only refer to those of the greatest physiological and general interest.

The first to attempt an explanation of this point was Morell Mackenzie. He suggested that the fibres which supplied the abductors ran a superficial course in the recurrent laryngeal nerve, and the fibres to the adductors a deep one. If this were the case, a tumour of any kind pressing on the nerve would be likely to affect first the superficial abductor fibres, and only secondarily the adductor fibres. Unfortunately, this is only a theory, and is contradicted by the fact that the degeneration of nerve-fibres, which has been observed in cases where a tumour

produced abductor paralysis, is seen quite as much in the central as in the superficial parts of the nerve. I shall mention a little later the result of attempts that have been made to separate, by dissection, the two classes of fibres from one another, and the success that has attended this effort by Risien Russell, but there is no such distinction between them as is assumed by this theory, and therefore this explanation may be regarded as unsatisfactory. Mackenzie probably saw this himself, and hence propounded an alternative hypothesis. He assumed that the adductors derived a second source of nerve-supply, viz., from the superior laryngeal nerve, and that hence, when the inferior was implicated, the adductors did not suffer as completely as the abductors. This is all very well as far as it goes; but the obvious corollary of it is, that to explain *complete* paralysis of the cord, we should have to assume disease of both superior and inferior laryngeal nerves. But dissection shows that, in cases of complete paralysis, this is by no means the case. The only nerve that is affected is the recurrent, and so this theory also falls to the ground.

The adductors are, as I have said, a more numerous and stronger group than the abductors. This can be shown by irritating the cut end of the recurrent when closure of the glottis takes place. Obviously, therefore, any affection which impairs the nervous power of the muscles generally, will tend to produce a marked effect first on the weaker group. This has no doubt something to do with the effect; but I shall mention observations which show that if this is the truth, it is only a small part of it, and is quite inadequate to explain the different physiological status of these two groups of muscles.

The same considerations apply to a suggestion of Dr Gowers —viz., that the abductors, being inserted into the muscular process of the arytenoids at an acute angle, act at a mechanical disadvantage compared with the adductors, which are inserted at an obtuse angle. Whether that is so or not is, of course, merely a question of physics. There are numerous facts, however, which go to show that there are wider differences than those of merely mechanical conditions between these two groups of muscles,—differences which seem to be quite peculiar to the

larynx, and which are, so it seems to me, of the greatest physiological interest and importance. There seems to be no doubt that between the posterior and the lateral crico-arytenoids— muscles so similar in appearance, and so close together—differences in biological status exist of the most profound character.

The first experiments directed to this point were made in America by Hooper. As has been stated above, if the peripheral end of the cut recurrent laryngeal be stimulated, a closure of the glottis takes place. Hooper found, however, that when the animal was very deeply under the influence of ether, almost on the point of death, if the peripheral end of the nerve were stimulated, instead of adduction, abduction occurred. Now, as the nerve was cut across, this effect could not have been produced in any reflex manner, and can only be explained by a discriminating effect of the drug reaching the laryngeal muscles by the circulation, and it points to some vital difference in the two groups of muscles, as shown by their reaction to the effects of this particular agent.

These results were repeated by Horsley and Semon; who also obtained effects from freezing the recurrent nerves, and other methods, which are of much interest.[1]

They found that if you gradually destroy the vitality of the recurrent laryngeal nerve by freezing it, the irritability of the abductors was always lost long before that of the adductors.

So also in patients dead of cholera if examined immediately after death, the abductors always lose their contractility before the adductors.

These experiments clearly show that there is a difference in biological condition between these two groups of muscles, the abductors and the adductors, but give no explanation at all of the reason for this difference. Grützner has attempted to find one in the different arrangement of the nerve-endings in the two groups, and has compared the ab- and ad-ductors to the " red " and " white " muscles of Krause and Ranvier. Whether this is anything more than an analogy remains, however, to be proved.

[1] Horsley and Semon, *Brit. Med. Jour.*, Aug. 28, 1886, p. 404–406.

A much more probable source of explanation is to be found in a consideration of the different physiological uses which the two groups of muscles serve. The adductors—the muscles of voice—are voluntary; the abductors—the muscles of respiration—are involuntary; and further, it has been shown that the abductors are normally in a condition of physiological tonus, by which the cords are kept slightly separated from one another when no effort either of inspiration or phonation is being made. Now, bearing this difference in mind, it has been pointed out by Fränkel that an important light is thrown on the respective manner in which these two groups of muscles are affected by pressure on the recurrent laryngeal, from some experiments by Zederbaum on the sciatic nerve of the frog. Zederbaum laid bare the sciatic nerve and placed a ligature around it. He then proceeded to stimulate the leg, both reflexly by irritating the skin, and directly by electrically stimulating the nerve above the point of ligature. He found in every case that while the direct impulses passed unaffected through the clamped part, the impulses started by reflex stimulation were entirely arrested by the ligature. This was not due, as one might suppose, to interference with the afferent fibres by the clamp, because stimulation of the skin of the affected limb produced reflex movement on the limb of the opposite side in the usual manner. There seemed, in fact, to be a direct obstacle to the transmission of motor impulses down the nerve which had their origin in reflex stimulation of the skin, while those which were sent direct from the brain passed unaffected, or were even heightened in effect. Now *tonus* of a muscle is, as one knows, a reflex condition, and anything which interferes with the reflex arc will destroy this physiological condition of tonus. Therefore if we apply these results of Zederbaum to the recurrent laryngeal nerve, it becomes more or less intelligible how a pressure on its trunk will tend to produce, as a primary effect, destruction of the tonus of the abductors. The adductors, on the other hand, will not be affected by the pressure at first, and, in fact, may even become over-active. Now, the destruction of the tonus of the abductors — the abolition, in other words, of a

state of physiological tonic contraction—will after a time give
rise to a condition of more or less atrophy from disuse; and, as a
matter of fact, this atrophy of the postici is a constant post-
mortem appearance in these cases.   As the muscles atrophy,
they begin, of course, to lose their power, and thus the vicious
circle becomes completed.   There results, then, more or less
complete paralysis of abduction, and the cord or cords remain
in the middle line.   Now, it is well known that if any group of
muscles become paralysed, their antagonists get into a condition
of secondary contraction.   Consequently, as the abductors of the
cords get weakened, their antagonists, the adductors, contract and
bring the cords still nearer the mid-line of the larynx.   But not
only do they get into a state of permanent tonic shortening, but
they become liable, on occasion, to attacks of clonic or convul-
sive spasm, and to this is no doubt due the attacks of spasm of
the glottis which are to be met with, as I have before mentioned,
in these cases of abductor paralysis.   We are now in a position
more or less clearly to understand the course of events which
follow the presence of a tumour or other growth on the motor
nerve of the larynx.   First, there is loss of tonus in the abduc-
tors; then the abductors begin to waste and weaken; and finally,
secondary contracture of the adductors and spasm of the glottis
supervene.   I know of no more ingenious explanation of an
apparently unintelligible fact than this extension of Zeder-
baum's results to the subject of laryngeal paralysis.   The credit
of it is due to Fränkel, and it certainly does seem to shed some
light on the proclivity of abductor paralysis to be the first result
of organic disease affecting the trunks of the motor nerves of the
larynx.

   There is just one other experimental result to which I should
like to refer, and that is the results obtained by Risien Russell
by dissection of the individual fibre of the recurrent laryngeal.
Russell showed that along with a physiological difference be-
tween the abductor and adductor fibres, they can be separated
from one another right up the nerve-trunk and down to the
muscles, and that the same difference in vitality exists in the
separated bundles of nerve-fibres as in the nerve-endings and the
muscles themselves.

Such, then, is a short statement of the differences—mechanical, physiological, anatomical—which exist between the abductor and adductor muscles of the vocal cords. They go, I think, pretty far towards an explanation of the law of Semon,—viz., that in all organic disease pressing on the motor nerve of the larynx, the abductors suffer first, and not unfrequently exclusively.

Laryngeal paralyses, however, occur not only as the result of peripheral disease, but also, and very importantly, in organic disease of the nervous centres. Now, although Semon's law applies to these as well as to the peripheral ones, there is as yet no such complete proof of differences between the centres of the two movements respectively, as between the muscles which carry out those movements and the nerves which supply those muscles. Still it seems reasonable to conclude that in disease affecting the two nerve-centres equally, the greater effect will be produced on those muscles which have a greater proclivity to become affected. I have not time to give an account of the cerebral representation of laryngeal movements, though much is known about them. I can only give in brief the results of experiment on the centres as far as they affect the particular question in hand. All that can be said as to this is:—

"(1) The centres of phonation and breathing are quite distinct, and therefore one may be affected without the other.

"(2) That, considering the vulnerability of the abductors, it is probable that a disease of the respiratory centre in the medulla may cause atrophy and paralysis of the abductors.

"(3) That a one-sided affection of the cerebral phonation centre cannot cause unilateral paralysis of an adductor.

"(4) In the light of Risien Russell's results, we may assume a greater vulnerability of the centres as well as of the nerves."

I am afraid this question of the peculiar tendency of these

posterior crico-arytenoid muscles is largely only of special interest, but I should not have brought these results of experiment and observation on this point before the Society unless it had some general bearing as well.

This general relation has to do with the importance of laryngeal examination in the diagnosis, positive or negative, of serious organic disease of such different regions as the brain, nerves, and cervical and thoracic organs generally.

In various tumours of the chest—aneurisms mediastinal tumours, and the like—paralysis (abductor paralysis) is a common occurrence, and its existence will often serve to confirm a doubtful diagnosis of these diseases. But further, it will, I hope, be clear from what has been said—

(1) That abductor paralysis may exist, particularly if it affects one cord only, without any symptoms.

(2) That therefore a laryngeal examination should be made in all doubtful cases.

(3) That if abductor paralysis is found to exist, we may with certainty diagnose some organic disease.

(4) That if only paralysis of the adductors is found, we can with equal certainty exclude organic disease of the nervous centres or trunks.

I may perhaps, in conclusion, refer to some of those nervous diseases in which laryngeal paralysis are often observed. These are chiefly the class of chronic degenerations of the medulla and upper part of the spinal cord, and include tabes dorsalis, progressive muscular atrophy, and the various forms of bulbar paralysis. In quite a large proportion of cases of locomotor ataxy abductor paralysis has been found, and it is clearly of great importance, if present, in assisting the diagnosis between true tabes and the various forms of pseudo-tabes; because, if present, it shows certainly the existence of organic disease of the nervous centres or trunks.

The relation of bulbar paralysis to abductor paralysis of the vocal cords is interesting and important. Contrary to what one might expect, abductor paralysis is by no means a constant symptom in progressive nuclear bulbar disease, in spite of the

name labio-glosso-laryngeal palsy sometimes given to it. It only occurs as a rule as a late symptom,—the nuclei of the accessory nerve, which are the true centres for laryngeal movements in the medulla and cord, being apparently the last to be invaded in the march of the degenerative process. On the other hand, when coarse organic disease—tumour or aneurism —presses on the bulb from without, abductor paralysis of the larynx is the rule. This may possibly help to distinguish between these two classes of cases, which may otherwise be clinically alike. The alteration in voice observed in bulbar paralysis is often due not to any laryngeal affection, but to the effect of paralysis of the soft palate and the pharyngeal muscles on the vocal resonance.

I have not time to discuss the many other relations of laryngeal paralysis, but I hope I have said enough to show that this question of the origin and meaning of abductor paralysis is not without interest in general as well as special medicine.

Dr HUNT thought that in the present state of uncertainty as to the actual innervation of the larynx, we could not finally settle all the questions in regard to laryngeal neuroses. Semon's law was now almost universally recognised, though there were a number of recorded cases not conformable to it. A parallel to the greater vulnerability of the abductors might be found in lead palsy, where the radial nerve was attacked before the ulnar. Bilateral abductor paralysis did not always mean organic disease, as he had seen it follow a laryngitis and end in recovery. There were also the cases of Schrœtter and Penzoldt, where this form of paralysis was due to hysteria.

Mr BARK wished also to express his thanks to Dr Permewan for his very able paper, and especially for the very lucid manner in which he had placed before them the literature respecting that much disputed point—why the abductors should become sick before the adductors,—as well as for the description of the numerous experiments of the different theorists. Mr Bark said that most laryngologists now acknowledged that Semon's law

was correct: though the many theories as to the actual reason for it were conflicting, he thought the suggestion of Gowers was a most reasonable one,—that the postici, being the weaker of the two sets of muscles, must, when the recurrent nerve was interfered with, inevitably go to the wall first; and conversely, when recovery took place, the stronger muscles would be the first to regain their power. He disagreed with the writer's assertion that all cases of bilateral posticus paralysis were due to central disease. He had had one patient at least where he believed the cause was catarrhal (peripheral neuritis), and the after-history supported this view. He agreed as to the value of laryngo-scopical examinations in the early diagnosis of serious brain mischief, and quoted cases where patients had been sent to him solely on account of weak voice, but on examining the larynx the cords were found moderately abducted and motionless. This led him to suspect grave central mischief, and to give a very guarded prognosis, and the subsequent history of such cases usually justified the opinion.

Dr BARR, after congratulating Dr Permewan on his clear exposition of a difficult subject, stated that the earlier and more marked involvement of the abductor than of the adductor muscles of the larynx in organic paralysis had a parallel in many cases of multiple neuritis affecting the extremities, notably in lead palsy. Dr Barr could not agree with the usually accepted doctrine that the lead had a special selective affinity for the extensor muscles, because the flexors are also affected, though in a less degree. The flexor muscles are much stronger than the extensors, and hence an amount of neuritis capable of completely paralysing the latter has only a paretic effect on the former.

Dr BRADSHAW could not accept Dr Barr's view that the extensors appeared to be specially affected in lead paralysis, merely because they had less power to start with. The paralysis of the extensors was accompanied by reaction of degeneration, and followed often by complete loss of irritability,—phenomena which did not take place in the other muscles of the limb.

THE VALUE OF ABDOMINAL OPERATIONS IN THE TREATMENT OF MALIGNANT DISEASE OF THE ALIMENTARY TRACT. By DAMER HARRISSON, F.R.C.S.E., Hon. Surgeon, Northern Hospital, Liverpool.[1]

MR PRESIDENT AND GENTLEMEN,—In writing this paper I have confined my attention to those operations for the temporary or permanent relief of malignant disease which have been performed sufficiently often to provide us with results upon which some conclusion may be based. Such operations may be enumerated as follows:—Gastrostomy; pylorectomy, with or without gastro-enterostomy; gastro-enterostomy; and colotomy.

In dealing with these operations separately, I shall be obliged to refer to the much-vexed question of statistics; and it is therefore, perhaps, advisable to say a word or two here as to the general value of statistics as a basis of argument for or against any of these operations.

Where cases of cancer of the œsophagus, pylorus, or rectum present themselves in the last stages of obstruction, the mortality of any operation for their relief will be necessarily, under the circumstances, enormous.

The mortality of colotomy, for instance, may be made to vary from 1 to 90 per cent. by the prudence or imprudence with which the selection of cases is made; and in the same way, gastrostomy and other operations on the stomach may be made to appear in a more or less justifiable or unjustifiable light.

Those who oppose the value of an operation may reasonably throw doubt upon the *bona fides* of the statistics, knowing, as they do, the human weakness which prompts to the trumpeting of successes, and the keeping of failures out of sight.

The gentlemen who press this argument upon us, however, sometimes fail to give proper consideration to the factors which much modify statistics that appear unfavourable—namely, the

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[1] Read at the Liverpool Medical Institution, March 15, 1894.

prudence, or otherwise, in the selection of the case, and the skill and rapidity with which the operation is performed.

Some statistics are, however, of great value, being free from many of the sources of error to which I have alluded, namely, the statistics taken from the practice of surgeons whose work is under the observation of others, who may be witnesses for or against the correctness of their statements. Fortunately for surgery, such valuable statistics do exist in connection with the subject of our discussion this evening.

I will now attempt to deal with each operation separately, beginning with *gastrostomy*.

This operation, owing to Howse and antiseptic surgery, is now attended with only a very small mortality in properly selected cases; that is, unless a late period of the disease is waited for before the operation is performed, when exhaustion from starvation " appears (in Mr Jacobson's words) as the hand of death on the patient, and something next door to the decomposition of the grave has already set in."

Yet this is the condition in three-fourths of the cases as presented by the physician to the surgeon. After *peddling* too long with bougies and tubes, with much distress to the sufferer and most harmful fretting of the growth, the physician at the eleventh hour passes the case on to the surgeon. The surgeon, unfortunately, consents to operate, and the patient dies from the operation. This sequence of events occurs two or three times, with often a most unreasonable effect upon the minds of both surgeon and physician. The physician, who has been the leading villain in these tragedies, scouts the operation as a surgical murder; the surgeon, too much impressed with his own failures, and too little impressed with the real cause, and the successes of others, says he will do this operation no more, and holds his own experience up as a warning to the profession.

In my own practice I have had only three cases of gastrostomy, two of which were for malignant œsophageal disease. Both these cases died some hours after the second stage of the operation had been completed, and after feeding through the fistulous opening had commenced. In both cases great exhaus-

tion was present,. and the operations were performed at too late a period.

The statistics collected by Blum repeats the same story. Of 181 cases, 85 died, not from any complication arising from the operation, but from the extreme exhaustion due to long delay. With regard to the statistics of individual surgeon's work, I can hardly do better than mention those of Jacobson and Newman. Jacobson has operated nine times, with four deaths. Of the four deaths, three were operated upon too late, and the fourth was due to a surgical accident when completing the second stage of the operation. Of the five recoveries, three were still living when reported, and two died six months and four months respectively after operation. If three of the cases which ought not to have been operated on are subtracted, six cases are left, with one death due to an accident.

Newman of Glasgow has reported four cases, all successful, and *giving much relief* to the patient, which in nearly every one of the recoveries from operation may be represented by gain of weight and strength, and freedom from pain and irritation during the few months that life in any case remains. Freedom from distress of passing tubes, with the not infrequent choking which accompanies this treatment. Freedom of irritation to the growth, rendering progress of the disease slower. *Freedom* from possible injury to surrounding important parts by bougies.

Senn, in speaking of this operation, says that, if done before a later period of the disease has arrived, it is "a comparatively safe procedure, and adds from a few weeks to eight months to the patient's life."

This statement of Senn's appears to be supported by all the evidence obtainable. What should be the indications for operation before the later period has arrived? Should we not operate without delay—

(1) When the patient becomes restricted to liquids, and has to take a semisolid diet?

(2) When the rate of emaciation is represented by as much as a loss of 2 to 3 lbs. per week?

(3) *Before* the temperature keeps below normal ?

(4) When there is evidence of any injury caused by the passing of tubes ?

I have seen three successful cases, and I venture to say that few of those who have met with such cases will hesitate to prefer the result of this operation if performed early, with its gain in weight and strength and freedom from pain, to the distressing condition without it.

I will now pass on to the operation *of pylorectomy.* In making any estimate of this operation, as a justifiable procedure or otherwise, we find that the selection of suitable cases is surrounded with great difficulties.

The detection of this disease is often very difficult, if not impossible, in its earlier period. Sometimes a tumour is not at any time to be discovered; and if lymphatic glands are affected, these can only be discovered after proceeding to operate.

On the other hand, in more than half of all cases of cancer of the stomach the disease attacks the pylorus.

Out of 542 cases dying of cancer of the pylorus, 223 had no secondary deposits; and of these 223 cases, 172 had contracted no adhesions.

This means that, even when the disease is allowed to run its course, in half the cases it remains perfectly isolated.

A much higher number, therefore, of cases in which the disease is isolated would be found at an earlier period.

The duration of life, if the disease is allowed to run its natural course, varies from one to twelve months, although a few cases are reported as longer in their duration. The larger number of cases, however, seem to run a comparatively short course. Hilton Fagge, for instance, speaks of three successive cases of his own, the duration of which were one month, nine weeks, and three months respectively, dating from the first distinctive symptoms.

Now, what is the condition of these cases ? Both the inevitably fatal character of the disease, and the suffering entailed thereby, has to be carefully kept in mind. The suffering from

pain, vomiting, hunger, and distension of the stomach; slow, inevitable starvation, extreme weakness, and perhaps anæmia, due to repeated hæmorrhages, at last puts an end to a miserable and agonising existence.

I think I have now mentioned some reason for the surgeon looking to an operation for this disease as one which should be brought within the limits of practical surgery.

The operation after Billroth's method, although not very satisfactory, is often made to appear much worse than it really is by lumping the earlier operations with those of more recent years. This is not a fair method of estimating the position of this or many other operations. The early period in the history of all serious operations has shown a large mortality, and such have had to be gradually established by improvement in methods and selection, often in the face of much opposition.

In the early days of ovariotomy, the argument that the sum of human life was lessened by the operation was used repeatedly; and even if it were true at the time, the prolongation of life due to the operation in later days has many times made up for the shortening of life at a previous period.

A distinct history of improvement is to be recorded with regard to this operation since 1881.

For the following five years the mortality was about 75 per cent., taking all the cases.

M'Ardle's collected records of 62 operations (up to, I think, 1888) show some improvement. Of these, 35 died, and 27 made good recoveries, many of them being reported well four years after operation. Of the 35 deaths, 21 were directly from the operation (collapse), 14 from peritonitis or septic absorption.

With regard to the cause of death, these statistics are very similar to others, which all show about two-thirds of the deaths from collapse.

Billroth's statistics up to December 1891 were represented by 29 operations, with 13 recoveries and 16 deaths.

Of the 13 recoveries, 5 died within ten months, 2 after one year, 1 after one and a half years, 1 after two and a half years,

and 1 after five and a quarter years. *Three* were still living in December 1891.

Rydygier has recently recorded 5 successive operations, with only 2 deaths.

Czerny, 4 successive operations, with 2 deaths.

I have myself collected a series of 17 operations performed by English and American surgeons during the last four and a half years, with 10 recoveries and 7 deaths.

Most prominent among these cases is that of Dr Rawdon, who has the honour of being the first Englishman to perform this operation successfully.

In reading the records of a large number of cases, one is astonished at the number operated upon in which the operation was distinctly contra-indicated from the first.

Such cases, for instance, as those in which (1) the stomach is greatly dilated (extending to the left iliac fossa); (2) the growth large, fixed, and displaced; (3) the patient in a bad condition for any operation.

On the other hand, there are cases that are perfectly selected, but yet succumb to the operation.

There is one more important factor that can hardly be over-estimated (when we remember that three-fifths of the deaths are from collapse), and that is, the time taken in completing the operation. This varies among different operators from one and a half to three hours; one American surgeon mentioning with some complacency the fact of having taken three hours to complete the operation, devoting one hour to the ligature of the omentum. By the light of the statistics of this operation, it is at present not one that a surgeon can, consistently with duty, advise a patient to undergo, and he ought not to undertake it unless at the patient's request, after fully explaining to him the great risk of failure. The first stage of the operation should be of an exploratory character, the surgeon undertaking not to proceed with the operation unless the case prove to be in every way a suitable one for excision. If the operation were approached in this way, it would soon hold a better position, from being performed in only very carefully selected cases, and an explora-

tory incision would come to be looked upon as a necessary
procedure in diagnosis and selection.

Again, those who are strongly opposed to the operation should
hesitate, now that a new method, that of combined pylorectomy
with gastro-enterostomy, enables the surgeon to more completely
remove the disease in a shorter time, and so far holds out distinct
hopes of a lessened mortality. During the last three years this
combined method has been tried nine times,—

					Cases.	Recoveries.	Deaths.
Doyen (Rheims),	.	.	.		2	1	1
Baronöz (Lemberg),	.	.	.		1	1	0
Bull (New York),	.	.	.		3	1	2
Jessett (London),	.	.	.		1	1	0
Greig Smith (Bristol),	.	.			1	0	1
Lowson,	.	.	.	.	1	0	1
		Total cases,			9	4	5

—giving four recoveries and five deaths.

Of the five deaths, one was due to a surgical accident, namely,
leaving a sponge behind in the stomach, and should therefore
not be counted as against the operation.

Deducting this case it leaves eight cases, with four recoveries
and four deaths.

Of the remaining four deaths, not one was due to collapse, but
all were due to faulty suturing, with consequent leakage, the
leakage not occurring from the cut ends of the stomach and
duodenum, but at the points of suture between the stomach and
bowel.

The weak point in this operation, and one that also applies to
the simple operation of gastro-enterostomy, is the possible leakage,
and contraction of the opening between the stomach and bowel.

These dangers may possibly be obviated by Mr Paul's modifi-
cation of Senn's method, namely, strangulation of the connected
surfaces of the stomach and intestine, and thus effecting by
sloughing a clean circular opening which shows no tendency to
contract between the bowel and the back of the stomach.

The operation of gastro-enterostomy has, in the opinion of some
surgeons, become the rival and substitute of pylorectomy. The

mortality, even among the earlier cases, is undoubtedly much less than in the earlier cases of the radical operation.

Mr Treves has collected nineteen cases, with three deaths and sixteen recoveries : ten of the recoveries were kept in view to the end, and from these cases it would appear that the average duration of life after this operation was less than ten weeks, with one exception—a case which lived until forty weeks after the operation.

Some cases die from contraction of the anastomotic opening, and some others from inanition caused by the pouring of bile and pancreatic juice into the stomach. About one-third of the deaths are due to collapse; about one-third to peritonitis (sometimes due to leakage); a few from kinking of the bowel at the site of junction to the stomach; and one from hæmorrhage into the stomach.

I have collected a series of twenty of these operations which have been performed during the last three years. These, with the addition of Mr Banks' two cases, make twenty-two in all. Of these, seventeen recovered, and five died.

This appears a low rate of mortality when it is remembered that several of these cases were performed under less favourable conditions than in cases of pylorectomy, the disease being more advanced, and the operation being performed only as a substitute for the more extreme operation. The prolongation of life in the successful cases does not, however, appear to me to be very satisfactory, and is probably only worth doing upon those cases which, either from the delay in diagnosis or other causes, have come into the hands of the surgeon too late for pylorectomy to be performed.

I think, therefore, that excision is still the operation which surgeons should strive to improve by better methods.

Pathologically, it is an operation which would seem to promise better results than almost any operation for the removal of malignant disease, and I still hope that it may be established on as justifiable a basis as either ovariotomy or hysterectomy.

I will not detain you long upon the last division of my

subject, namely, that of colotomy, for I hardly think there will be much division of opinion as to the value of this operation.

The mortality from this operation has been brought to such a vanishing point by several surgeons, about 1 or 2 per cent., that this consideration is hardly worth alluding to.

During the last two years, however, a few surgeons, who seem to have an irresistible desire to excise every cancerous rectum they meet with, have denied that any relief or benefit is conferred by this operation.

This statement can hardly be treated seriously by anyone who has any experience of these cases. In my own practice I have had several cases, and each of these was most successful in the relief it afforded the patient. One of these cases is still working, and when I saw him last, four or five months after operation, he was remarkably satisfied with his condition.

In colotomy we do an operation with scarcely any risk, and with no hope of cure, but we invariably prolong life, sometimes for a long period. We relieve pain and the distressing tenesmus and discharge from the rectum which so exhausts the patient. The operation delays the development of the disease, preventing the straining and congestion resulting from defæcation, prevents the complication of intestinal obstruction, enables the patient to sleep, eat, and gain flesh, and the general relief afforded is so great as to often make the patient think himself cured.

In conclusion, colotomy, like other operations upon the alimentary tract, should not be left until the patient has reached the terminal period of the disease, till acute obstruction has set in, or the base of the bladder is seriously involved.

While viewing thus favourably colotomy as a palliative operation, it must be remembered that, upon the undoubted authority of many surgeons, there are occasional cases which fail to be relieved, though carefully selected and the operation well performed.

The proper time to perform the operation of colotomy is immediately after a decision has been arrived at not to perform the operation of excision.

Dr ALEXANDER said that a few days ago he turned up accidentally a passage in Ranking's Abstract (vol. ii. p. 283), where the following words are applied in regard to the advisability of ovariotomy :—" It cannot be defended, as we must not only take into consideration the accidents resulting from it, but the important fact that dropsy of the ovary may exist for a series of years without the health being materially compromised. Who, under these circumstances, would dare to place the patient in danger of rapid dissolution ? "   This statement is only amusing to us now because we have learned how to perform ovariotomy.

About fifteen years ago Dr Alexander performed his first hysterectomy for cancer of the uterus by Freund's method, and the patient died from the operation. That was the general result then, but nowadays, by improved experience of his own, and by taking hints from others, he has had a succession of ten recoveries, and the operation is so safe that surgeons do not think it worth while to report their cases.

Surgeons are now engaged in a determined contest with disease of the alimentary tract, and their initial operations will probably be as unfavourable for a time as in the above-mentioned instances, and in other diseases that could be named; but the issue will no doubt be successful, and adverse opinions expressed to-night may sound as ridiculous in the future as the opinion I have quoted about ovariotomy now does.

Malignant disease of the alimentary tract, like cancer elsewhere, kills in two ways,—most frequently by destruction of the blood and by interference with the nutrition of the body, assisted by the depressing influences of pain, and by the consciousness of the near and certain approach of death.   It less frequently kills by the mechanical interference with the function of the part itself, or of the contiguous parts. It is, we know, a local disease in the earliest stage, capable of being removed entirely, and in the mobile intestinal tracts its position in that early stage is a most favourable one for removal.

The problem is simple.   Diagnose the case in an early stage ; cut out the diseased part of the tube, and unite the cut ends of

the sound intestine, so that union will take place by first inten-
tion, and no leakage, gaseous or fluid, will occur during the
healing process. It must be confessed that neither the diagnosis
nor the operative procedures are satisfactory at present. Of
the two difficulties, the operative procedures are the most
important. Stitching is too slow and too insecure, and Senn's
plates sometimes warp or disappear too early, and leakage,
especially gaseous leakage, occurs. The latter is the cause of
death most generally, although the patient is mostly said to die
from shock. At present surgeons only operate on desperate
cases, because the remedy, as far as pylorectomy is concerned,
is a desperate one. But when the operation has become safer,
the earlier cases of the disease will submit to operation, and the
diagnosis in suspicious cases can always be safely verified by
exploration. From the number of men whose attention is now
directed to this branch of surgery, and the advances already
made in resection of the intestines, pylorectomy and its cognate
operations will in the near future be fairly successful.

The speaker had the pleasure of assisting Mr Rawdon in his
successful pylorectomy, and he has, so far, only met with another
suitable case, on which he operated unsuccessfully, due to the
warping of Senn's plates and the escape of gas. In two other
cases he had tried to operate, but the disease was too extensive
and could not all be removed. From his experience thus gained
he hopes his next case will be a successful one.

As regards palliative operations for cancer, Dr Alexander said
he had no sympathy with them. They were only occasionally
necessary, and only then in the final stages, and the operation
is generally at best only a prolongation of the agony. If he
had a cancer of the œsophagus, he would prefer his food *per
via naturalis* as long as possible, and the short respite gained
by gastrostomy he would not look upon as a relief. The opera-
tion is simple and safe, and sometimes answers its purpose. He
has only done it twice. Gastro-jejunostomy he has only done
once—a very advanced case—and the patient died next day from,
in his opinion, leakage of gas. Others said the patient died from
shock. The cases of cancer, where it is indicated, are few.

Colotomy is such a safe and well-established operation that there is no question of its utility in suitable cases. But these cases are very few, and he would never perform it when the patient is in comparatively good health, simply because it may be required in the future. The results are often very disappointing, and the management of the fæces very distressing to the patient; and many patients have said, after the operation, that had they realised the meaning of what had been told them about the nature of colotomy, they would have preferred their old condition to the new one.

Hence the endeavour should be to diagnose and remove intestinal cancer only, and to perfect our methods of suture of the bowels, so as to do it with more safety than at present.

Palliative operations, on the other hand, are only justifiable by urgent necessity. They cannot arrest the fatal course of the disease; and although they sometimes relieve, not unfrequently they make the last state of the patient worse than the first.

Dr BARR said that he took part in this discussion with a considerable amount of diffidence, because he thought that the propriety of operating on malignant disease of the alimentary tract was a surgical question, and surgeons were quite competent to settle such a matter for themselves. Unfortunately, statistics showed that a large number of the patients operated on for this class of disease succumbed soon afterwards, and the deplorable results did not reflect much credit on surgery. It is now our duty to try and find out the causes of failure, rather than inveigh against all operative interference. The physician is often blamed for not handing over the patients to the surgeons sufficiently early, but this very vague and general charge is usually employed to cover the retreat of the surgeon, who is under no obligation to operate in such cases. It must be remembered that the diagnosis of malignant disease of the alimentary tract is often very difficult, and the case has frequently well advanced before it comes under the care of the physician. The surgeons need not encumber their statistics with hopeless operations, but they might more frequently take a lesson from gynæcologists,

explore the abdomen, and have the courage to simply shut it up again if further operation was found to be unjustifiable.

Mr ROBERT JONES had very little faith in the utility of gastrostomy and gastro-enterostomy. He, however, differed from Mr Banks by believing that a distinct future was in store for pylorectomy. The point of clinical value to the surgeon was that the glands in connection with the pylorus were not early affected in cancer.

Mr PAUL agreed entirely with the remarks made by Dr Alexander. The palliative operations for the relief of cancer of the alimentary canal were of much less importance than radical operations, and in the future would probably, to a large extent, be replaced by them. In cancer of the œsophagus, so long as the way could be kept open by a bougie, he never advised gastrostomy; but when the patient was starving, he thought there could be no question that an operation successfully performed afforded relief. In cancer of the stomach, when a physician suspected the disease, he should allow a surgeon to make an exploration, as this was the only means by which an early diagnosis could be certainly made, and a small exploratory excision had never, in his experience, led to harmful results. When surgeons had more experience in operating on early cases of pyloric cancer, pylorectomy would become an established success. Gastro-enterostomy he considered still *sub judice*. There were certain objections to Senn's method, which he tried to overcome by a method previously submitted to the Society. In cancer of the bowel above the rectum, he could speak with more confidence, as he had performed colectomy six times. The first three patients died, but the last three, owing to an improved method, all recovered. Colotomy had yielded him much greater satisfaction than Mr Banks; but he much preferred to excise the rectum or part of the colon, than simply to adopt the palliative treatment of colotomy; in fact, he felt sure there was a good future for both pylorectomy and colectomy.

Mr RAWDON said he preferred not to take up the time of the meeting by entering into the discussion as to the advisability or justifiability of attempting to give relief in cases of cancerous affections of œsophagus, stomach, or bowels, by operative measures on the alimentary canal; but he wished to report to the members the condition of the patient upon whom pylorectomy was performed, Nov. 29, 1889, four years and four months ago. (The case was fully reported in the *Lancet*, April 12th, 1890, p. 800, by Dr Carthew Davey, late senior house-surgeon, Royal Southern Hospital.)

Mr Rawdon stated that he had visited the patient yesterday (March 14th, the day previous to the meeting), and that he found him in fairly good condition. No tumour or induration could be detected in the cicatrix or in the abdomen (epigastric region). The patient, it appears, had not been nearly so strong and well since August 13th, 1893, last year, when he had a sudden and severe attack of hæmatemesis, but up to that date he had worked at his usual occupation—a rigger—as hard and as well as ever he had done in his life.

Latterly, at rare intervals, he has had a little vomiting, and feels that he must be careful as to his diet. He has had no return of hæmatemesis.

He is now 60 years of age.

Mr BANKS said :—I was glad to see by the hearty manner in which the Society interested itelf in the subject of the debate of to-night that many of us were anxious to know where we stand in the matter of " Operating for Cancer of the Alimentary Tract within the Abdomen." Much of this department of surgery has originated within the last few years, and its growth is entirely due to our improved knowledge of how to keep the peritoneum aseptic. So rapid has been the advance in some departments of abdominal surgery that we must not allow our enthusiasm to run away with our prudence in this matter of cancerous disease. For I believe that the surgeon will in the future labour under the same serious difficulty that he does in the present, viz., the impossibilty of getting cancerous growths in their very

earliest stages, and while the patient has still sufficient strength to stand up against a serious operation. If it is difficult to catch patients sufficiently early who have cancer of the breast or tongue (where the disease is practically visible), how much more difficult will it always be to induce them to come with abdominal cancers which can neither be seen nor felt until they have obtained considerable dimensions?

Cases of Gastrostomy.

Four cases were operated upon at the Royal Infirmary. Two were old men, almost moribund, who only survived a day or two. The third (a male of middle age) survived about a month, and died from septic pneumonia. The fourth (a woman of 42) lived for three weeks, and died from exhaustion. The condition of the two latter was very distressing.

Cases of Gastro-Enterostomy.

Two cases were done, mentioned at last meeting. The first patient died from shock in about twenty-four hours, and the second died from exhaustion in about a week.

Cases of Colotomy.

1. Mrs S. A. W., æt. 27. Infirmary. Left lumbar colotomy; side opening in bowel. Died in four days from septic peritonitis, from escape of fæces into the deep parts of the wound.

2. Mr T., æt. 68, with Dr Harris, of Claughton. Left lumbar colotomy; side opening. Died in three days from exhaustion.

3. Miss W., æt. 55. Infirmary. Complete obstruction, from cancer of sigmoid. Right lumbar colotomy; side opening. Sank exhausted on sixteenth day. Much sloughing of fat of the wound, and even of the exposed bowel.

4. J. A., æt. 45. Complete obstruction, from rectal cancer. Left lumbar colotomy. Impossible to find colon, and therefore

nearest portion of small bowel brought out of wound and opened. Patient died exhausted after about a fortnight, and then it was found that a piece of bowel high up in the jejunum had been seized.

5. Mrs C., æt. 55, with Dr Garson. Complete obstruction from rectal cancer, secondary to breast cancer. Left lumbar colotomy; side opening. Death from exhaustion in fourteen days.

6. Mrs M., æt. 31. Infirmary. Left lumbar colotomy. Lived about three months in much distress. Relief not satisfactory.

7. S. S., æt. 55. Infirmary. Left lumbar colotomy; side opening. Lived ten weeks. In constant distress from a foul discharge from the rectum coming from a great mass of cylindroma which nearly filled the pelvis. Constant morphia.

8. D. F., æt. 52. Infirmary. Inguinal colotomy. Lived about four months. Suffered dreadfully from pain, and had to be constantly deeply under the influence of morphia. He derived very little relief from the operation, and he and his friends were very much disappointed with it.

9. Miss H., æt. 44, with Dr Westby. Complete obstruction. Site of cancer not certain, so right lumbar colotomy performed. Lived three and a half months. Dr Westby says that after the operation she did not suffer any pain for any considerable time of an acute character. He thought the case one which shows the operation to be a decided means of prolonging life, with but little pain.

10. Mrs P., æt. 61, with Dr Barron, of Southport. Complete obstruction, but site of cancer not certain, so right lumbar colotomy performed. She lived eighteen months, and was able to sit up and go out into the garden; so that she lived a comparatively comfortable life. The patient expressed great gratitude that she been enabled to live so long to enjoy the society of her friends, many of whom were unaware of the serious condition she was in.

11. Mrs T., æt. 47, with Dr Nevins. Right lumbar colotomy; side opening. Patient lived nearly two years, but, after the first month or so her sufferings were very severe from pain,

and she personally regretted having had the operation performed.

12. Mrs. B., æt. 40, with Dr Matthews. Right lumbar colotomy ; side opening. Lived for eleven months in .much suffering, having to be kept under morphia.

13. O. C., æt. 40. Infirmary. Left lumbar colotomy ; side opening. Lived about six months, but suffered a great deal of pain, and was not much relieved.

14. R. E., æt. 43. Infirmary. Left lumbar colotomy ; bowel completely divided. Was in terrible distress before the operation, but experienced great comfort after it, and died quietly after about two months.

15. R. W., æt. 60. Infirmary. Left lumbar colotomy ; bowel completely divided. Experienced great comfort from the operation, living nearly a year after it. He got out and about, although unable to resume work. Had to take a good deal of morphia.

16. M. S., æt. 62. Infirmary. Left lumbar colotomy ; bowel completely divided. Left hospital in eight weeks " relieved," but he could not be subsequently traced.

17. Mc. K., æt. 44. Infirmary. Inguinal colotomy. In terrible distress from sanious discharge and escape of fluid fæces, owing to rectal epithelioma. Has been greatly relieved, and gets about a little, being in comparative comfort now, eight weeks since operation.

Resumé of Colotomy Cases.

1 died directly from septicæmia, the result of the operation.

1 died from mal-nutrition, owing to the colon not being found, and the jejunum opened high up.

3 died from exhaustion within sixteen days from the operation.

6 survived for periods varying from ten weeks to two years. nearly all in more or less severe distress, only relieved by subcutaneous morphia.

5 experienced great relief, and were much benefited, living from two months to eighteen months.

1 not traced.

With regard to the cases which I have brought before you
to-night, I am sorry they are so few in number, but they may be
of some service.　At last meeting I stated that I would never
do gastrostomy for œsophageal cancer again, and I said so quite
deliberately.　From what I have seen of my own cases and of
others, the condition of the patients is miserable—so miserable
that, were I unfortunately to become the victim of this com-
plaint, I would not have my stomach opened on any account,
and I believe there are very few men in this room who do not
think as I do.　When no more nourishment can be got down, let
the patient die as comfortably as he can, with the aid of a hypo-
dermic syringe.　Besides, the statement that has been made here
to-night that life, in cases of œsophageal cancer, is always termi-
nated by appalling suffering, is not true.　The last two instances I
have seen were in persons of my own acquaintance, whom I watched
during their illness.　One went about his work till within a week
of his death, and then died quite suddenly.　The other, who was
very fond of music, was playing his violoncello a day or two
before he died.　I have seen many patients die from ordinary
phthisis with signs of much more distress and pain than these
men did.

The two cases of gastro-enterostomy mentioned in the list
were described at last meeting, and I need not specially refer to
them.　I pointed out then that, however well planned and
executed they might be, the vitality to carry patients over the
serious shock necessarily connected with them was too often
wanting, and that what was really needed was more judgment
in the selection of our cases.　The mere mechanical difficulties
of gastrostomy and gastro-enterostomy are nothing.　They are the
easiest things in the world to do, and within the compass of the
most ordinary surgeon, although they sound very dreadful, and
have very long names.

The repair of a split palate, or the removal of a mass of deep-
seated tubercular glands from the neck, are, to my mind, in-
finitely more difficult operations and severer tests of a surgeon's
manipulative dexterity.　Nevertheless, although I consider gastro-
stomy so useless that it ought to be abandoned, there is sufficient

proof extant that from a successful gastro-enterostomy much relief may be obtained in certain well-selected cases, and I would be prepared to perform the operation if I saw good grounds for it—notably, as regards the strength of the patient.

Concerning pylorectomy, I have no personal experience. Our only success is Dr Rawdon's brilliant case. I imagine the operation will practically be given up in favour of gastro-enterostomy, for by the time the disease has been diagnosed and by the time the patient is so ill as to submit to operation, the chances of his recovery from pylorectomy are very remote.

Coming to the question of colotomy, we are here upon fairly safe ground, for there is no doubt of the advantage which it frequently offers to patients who are in a very distressing situation. But even here too glowing a view must not be taken of the matter. To begin with, the number of patients who sink in a few days under the operation is very considerable. Moreover, in the list which I have submitted to you, while to some the operation secured release from immediate death by obstruction, and afterwards afforded the greatest comfort, in others the rectal pain remained as bad as ever, and life was only endurable under large doses of morphia. Fifteen out of the seventeen cases were lumbar colotomies, in some of which the bowel was completely divided across. The other two were inguinal. On the whole, the inguinal colotomies have satisfied me well. There did not seem to be any particular difficulty about the operation, and the artificial openings were excellent; but two cases is nothing to go by.

May I be permitted a few criticisms on the words of the previous speakers? I am sure that Mr Damer Harrisson is taking altogether a too sanguine view of the value of surgery in abdominal cancer. His roseate picture of the colotomised patient with rectal cancer, to wit, is typical of what he would have us believe will come to pass with other operations. But his picture, unfortunately, is an ideal one. I wish it were otherwise. Let us have a photograph of the man, and, at the very best, we shall find him in sad distress; relieved, no doubt, but far from the robust and cheerful being that Mr Harrisson has

sketched for us. Again, it is quite absurd to say that blame attaches to the physicians who keep patients too long, so that they are practically done for before they come into the surgeon's hands. Nearly all cases of cancer of the stomach and bowels (excluding the rectum) are most insidious in character in their early stages, and most difficult of diagnosis; and before the physician can make certain of what he has to deal with, and before the patient can make up his mind to be operated upon, the disease has involved neighbouring parts, has laid hold upon lymphatic glands, and has undermined the patient's vitality. As to the infection of the glands being delayed in cases of pyloric cancer, this may be so. All I can say is, that during the five years I was pathologist to the Royal Infirmary I never saw a case of stomach cancer where the glands were not affected. The truth is, that the experienced physician mostly takes a broad general view of his patient's case and of his powers of resistance (as our old predecessors used very carefully to do), while the surgeon of to-day contemplates him from a mere mechanical and anatomical standpoint—in fact, regards him too much as a block of wood.

Dr Alexander wished to compare the would-be "pioneers" of the surgery of abdominal cancer to the early ovariotomists, whose proceedings, at first vehemently and bitterly opposed, ultimately convinced by their triumphant success their most envenomed adversaries. The comparison is unfortunate — it is a *bathos*. When the early ovariotomists proceeded to open the abdomen to remove tumours, they did what had never been previously attempted, and about which nothing consequently was known. Theirs, I admit, was real courage. But we of the present day stand in a totally different position. We have the experience of all the ovariotomists from the very beginning as to the mechanical part of ovariotomy. The method of opening the abdomen, the treatment of the peritoneum, the value of drainage, the methods of dressing, are all common to an ordinary ovariotomy, and to an attempt to cut out the cæcum or the pylorus. Moreover, the state of public opinion as regards abdominal operations is diametrically opposed to what it was in the early days of ovari-

otomy.   At present every surgeon, even the rawest, opens the abdomen *au cœur leger.*   I don't see any courage in it.   Very often I don't see any judgment.   I see a good deal that threatens soon to become reckless experiment.

If we were to adopt Mr Paul's view, every chronic dyspeptic ought to be at once subjected to an "exploratory incision."   I am afraid, however, that he will never live to see this surgical millennium.   They do say, in a certain metropolis, concerning a certain celebrated surgeon, that if a patient whose bowels have not been opened for three days consults him, he at once has his belly opened to relieve his obstruction.   Let us hope this is only a little surgical tale;—nevertheless it shows how the wind blows.

I think Dr Carter made a very sensible observation when he said that, so far, surgeons had not provided any sufficient evidence to show that, after all the labour that has been expended on perfecting operations for cancer of the stomach and bowels, the lengthening of human life by their performance was much increased!   I have been engaged for about fifteen years in an inquiry of this sort as regards cancer of the breast, and I find it a most difficult one.   Infinitely more so must it be to come to a definite decision in the subject under debate.

In conclusion, the reason why the surgical art in our country is in such high repute with the public is because it has been pursued with singleness of purpose, with scrupulous honesty, and with the profoundest regard for the welfare of the patient. I have a great dread of seeing this British surgery invaded by that *manic opératoire,* as a French surgeon called it, which constitutes a positive disgrace to it.   A very excellent American surgeon, who recently passed a couple of days with me, told me that he had just spent four months on the Continent, and that he had been so shocked by the recklessness and contempt for human life exhibited by the surgeons whom he saw, that no son of his should ever study surgery on the Continent.   I sincerely trust that Englishmen will always consider that mere daring operating is the last thing to be considered.   Another point which I venture to touch upon is the constant narration at

societies and in journals of successful and brilliant cases only, while no mention is made of failures. This is not a good sign of the times, to my mind. It cannot be termed a *suggestio falsi*, but no one can doubt that it tends to the *suppressio veri*. In plain language, it is not fair. We cannot come to a real sound judgment on data given in this spirit. It would be much better for us all if we were to take more time before publishing our cases, until such a number of them could be accumulated and followed up as would really afford a firm basis upon which to rest while considering the best thing to do for our patients.

I sincerely trust, Gentlemen, that I have not given any offence by making these remarks, for I would certainly be most sorry to do so. Moreover, I would deprecate being considered in any way a retrograde surgeon, for I have always striven in my surgical work to keep abreast of the times. I merely wish to plead for more care and judgment in our operative procedures and for an impartial narration alike of failures as of successes, so that we may not be living in a fool's paradise, while below our feet our very foundations are insecure.

CHRONIC INTERSTITIAL MASTITIS IN ITS RELATION TO CANCER OF THE BREAST.[1] By W. THELWALL THOMAS, F.R.C.S., *Hon. Assistant-Surgeon, Royal Infirmary, Liverpool; Demonstrator of Surgery, University College, Liverpool.*

CHRONIC interstitial mastitis is a distinct clinical condition met with during the involution period of the mammary gland—45 years to the end of life ; and as the same period is the one in which carcinoma is likely to appear, the relation of one disease to the other, if any, will be considered.

In the developing and lactating breast one meets with acute and subacute mastitis, which are readily curable, although the latter variety has occasionally been confused with chronic interstitial mastitis. In the involuting breast, when acini dwindle from slow atrophy of their epithelium, accompanied by contraction of the interlobular connective tissue, some portion of the process may "go wrong," leading to irritation of acinal epithelium, and the slow formation of cyst, so common in old breasts. The occurrence of a cyst has always been considered a danger, from its naturally hindering shrinkage of the breast, and by enlarging, irritating more and more the gland, and in time "worrying it" into cancer.

Many cases are recorded of this association, and many more can readily be recalled by surgeons. "Snow" (*a*) records three that became cancer, 20, 21, and 42 years respectively, after the first observance of a cyst.

When this irregular involution takes place throughout the gland, we have what is known as chronic interstitial mastitis, which is, therefore, a change occurring after 40 years of age.

[1] Paper read at the Medical Institution, November, 1893.

It progresses quietly, often without symptoms, and occurs very frequently in both breasts.

Sooner or later, the patient's attention is directed to the gland, by a small twinge of pain, or accidentally finding a small lump; then she comes under observation. The breast on examination is generally affected throughout, and the great extent of a mammary gland is only appreciated in this condition.

When the breast is flattened out on the chest wall by the hand, lobules are found very nodular; the nodules like "shot" embedded in tough groundwork. These nodules, which rarely exceed a pea in size, are small cysts in the fibrous gland.

The contraction of the interstitial tissue produces slight puckering of the skin, and may even depress the nipple, thus simulating carcinoma. Cancer, however, causes the well-known pigskin appearance. Occasionally, the lymphatic glands in the axilla can be made out, but are not hard or much enlarged.

This condition of breast has been, and can be, often cured by rest, fixation, bandaging, and the application of iodine or mercurial preparations; but many recorded cases have been confused for subacute mastitis in younger subjects, where only one or two lobules are affected, are tender, and readily resolved by the same means. The gradual transition into cancer is unfortunately common, and is heralded by slow but steady increase in size of one of the small nodules; this increase very rarely being due to cystic enlargement, the surrounding tough fibrous tissue probably preventing this, but to the onset of malignancy; and no amount of fibrous tissue resistance can impede the march of carcinomatous cells.

Pathology.—Many sections were made from five cases where removal had taken place; in some no carcinoma was present, although the cases were regarded as such; in two, malignancy had supervened, and from these cases the following observations have been deduced. To the naked eye, the breast on section is very fibrous, and dotted over with tiny cysts, from

which escape a drop of clear fluid, occasionally coloured and thick in consistence.

Microscopically.—Photo-micrographs were exhibited illustrating the various stages.

In the earliest degree the small irregular acini are surrounded by round cell exudation, which in places is developing into fibrous tissue, in parts appears to surround only one acinus, in other places encircling groups.

The contraction of fibrous tissue leads to—

(1) Slow obliteration of gland spaces, and atrophy of the epithelium, so that only irregular fragments of protoplasm and nuclei remain.

(2) Stimulation of the secreting cells, leading to the formation of small cysts. In only three sections can a tendency to intra-cystic growth be detected.

(3) Stimulation of secreting cells, causing them to rapidly multiply, distend the acini and small ducts, and in time burst through the basement membrane. In some sections an acinus appears to have exploded, scattering its cells between fibrous-tissue bundles radiating from the gland space. This appearance may be described as an "explosion area." This escape from control by the basement membrane, and the scattering of irritated cells into the fibrous tissue, is the onset of cancer.

When malignancy supervenes during the course of a case, a nodule enlarges; and, occasionally, at this stage the disease is first noticed by the patient, and the medical attendant may be the first to discover that the other breast is universally affected by chronic interstitial mastitis.

In one case (Mrs H.) the nodule was the size of a filbert, in the centre of a thickened and nodular breast. The enlarged nodule alone was cancer, the rest of the breast inflammatory. The termination of a case, pathologically speaking, appears to depend upon the issue of a struggle between fibrous tissue and gland epithelium. If the fibrous tissue succeeds, the case remains simple; if the epithelium, then cancer is the sequel.

The diagnosis of malignancy is not always easy, and

many nodular breasts have been excised as carcinomatous, which, on examination, were simple. In the five cases it has fallen to my lot to examine, three were simple, although removed as cancer or "suspicious"; two only had changed into carcinoma. They were—

(1) Mrs H., æt. 43; five children; case sent by Dr Napier, Egremont; three months' history; right breast; patient found a small lump when washing; a little twinge of pain recently. At the upper and inner corner of the breast was a small nodule, hard, and adherent to the skin, the rest of the breast tough, and full of tiny nodules.

The left breast was discovered by Dr N. to be generally affected with mastitis, but lacked an enlarged nodule.

Breast removed. The skin had to be extensively sacrificed, owing to tough adhesions of fibrous nature between the breast and the skin, not by any means limited to the carcinomatous nodule. She remained in hospital five weeks.

The left breast was bandaged; twelve months later the left breast is unaltered.

(2) Mrs E. T., 50, June 1893, found a small lump in the right breast. Had never suffered from any pain in the gland.

The whole breast was nodular; one nodule hard and somewhat isolated; this was hard, and attached to the skin. Axilla normal. Operation—removal—July 26th, 1893.

The non-malignant removals were by different surgeons, from women æt. 43, 49, and 52 respectively.

The increase in size of a nodule in a chronic breast appears to indicate the onset of malignancy, and I take it that then is the time to operate, without waiting for any definite enlargement of the axillary glands.

Birkett (b), in reference to the treatment of this affection, writes:—"After vain attempts to control the increase of growth, the patient at last submits to operation."

Chronic inflammation of other tissues in the body so often

ends in malignant disease, that one is not surprised that the form of mastitis described likewise does so.

Chronic interstital glossitis, the development of epithelioma on chronic ulcers and on the scars of lupus, might be instanced.

This danger is hardly sufficiently emphasised by writers on the subject. See

Annandale (c)—"May develop into cancer."

Bowlby (d)—"This condition is not infrequently the precursor of carcinoma."

Paget (e)—"The coincidence with cancer appears not rare."

Beck (f)—"Occasionally starting-point of cancer, but this is certainly rare."

References to the general subject of carcinoma succeeding chronic inflammation are found in—

Bryant (g), as a cause of cancer in the breast, states—"Some spurious functional activity or degenerating involuting change, which as an acute affection may have damaged, or as a chronic one may have irritated, tissue."

Rindfleisch (h)—"The case is probably one of plastic corpus-cular infiltration of the connective tissue, which, as we know, constitutes a neutral prodromal stage of the majority of morbid growths."

Maier (j)—"There is often a short step from an inflammatory hypertrophy to a circumscribed hyperplasy, which becomes an infectious growth."

Jones and Sieveking (k), as an instance of the difficulty of diagnosis, observe—"We have since repeatedly examined the structure of mammary growths which were examined as malignant, and found them to consist of follicular structure filled with epithelial growth."

When we consider how ready to rouse into great activity mammary epithelium is during pregnancy, and as quickly to slumber again when lactation is over, we must not be sur-prised that some irritation during the involution period is very likely, if persistent, to rouse the epithelium to abnormal growth. The cells, instead of receiving more and more rest to allow them

to slowly undergo the atrophy which is natural, are subjected to the continual "worry" of contracting inflammatory fibrous tissue, and multiply without rhyme or reason, lose all respect for so-called trophic influences, and run riot in a reckless carcinomatous manner.

REFERENCES.

(a) *Cancer and Cancer Processes.*
(b) *Dis. of Breast,* 1850, p. 146.
(c) *Internat. Cyc. Surgery,* p. 835, Ashurst.
(d) *Surg. Pathology.*
(e) *Surg. Pathology.*
(f) Heath's *Dictionary of Surgery.*
(g) *Diseases of Breast.*
(h) *Path. Anatomy,* vol. ii., Syd. Soc.
(i) *Path. Anatomy.*
(k) *Pathology,* p. 784.

CASE OF AORTIC REGURGITATION. By JAMES BARR, M.D., *Physician, Northern Hospital, Liverpool.*

THE following case is very interesting, as showing how long a man suffering from a serious heart lesion may enjoy perfect health, although engaged at a very active avocation. It also shows how an injury may be unwittingly caused by a well-meant medical certificate.

J. B., aged 54, school-board visitor. Height 5 feet 11 inches, weight 160 lbs. without coat or vest. He is an active, energetic, and apparently very healthy man. He has led an active but careful life, and has enjoyed, as a rule, good health. At the age of 19 he suffered from rheumatic fever, but has since had no recurrence. In September 1879, when 39 years of age, he was under my care, and confined to bed with aortic regurgitation and cardiac failure. He soon recovered and resumed his duties as school-board visitor. In June and July 1881 he consulted me a few times, and I gave him a certificate, stating that he was suffering from aortic regurgitation, and recommended that he should have a lighter district to work. At that time the Liverpool School Board was suffering from an economic seizure, and unfortunately there were some medical men on the board, who took a very serious view of the lesion from which their servant was suffering. My patient was told that, as he was suffering from heart disease, he was unfit for the service of the board, and he had better look out for some other employment. However, he was fairly satisfied with his work, and notwithstanding repeated warnings, he failed to get any other post, and in June 1883 he got a peremptory notice to leave the service of the board in three months. I was very indignant at this treatment, and accordingly wrote the following letter to a member of the board with whom I was acquainted:—

"I wish to draw your attention to the case of Mr B., school-

board visitor, who has got three months' notice to quit his situation for the offence that he has incurred disease of the heart in the service of the board, and may thus at some future time be rendered unfit for duty.

"Some time ago I gave him a certificate, stating the facts of his case, and giving it as my opinion that he should have an easy district to work. He got an easy district about six months ago, which I believe he has efficiently worked, and has given perfect satisfaction to the Christian Brothers, to whose school he has been attached. The change has also been with manifest advantage to himself, for his heart has markedly improved, and I have never known him in better health and physical condition than he is at present. He has proved himself quite fit for his present duties, and it seems to me very hard treatment to dismiss a man for a physical infirmity which does not interfere with the performance of his duties, and for which the previous hard work of the school board is accountable. A public body (as well as private individuals) should have some consideration for a man who has contracted a disease in their service, and not ruthlessly turn him adrift in the world, and perhaps into the workhouse, after nearly ten years' service. Hoping you may get the decision of the committee altered."

After some months he was reinstated, but he has never received the promotion to which, from length of service, he was entitled. Since 1879 he has not been one week off duty on account of sickness, which is more than any healthy member of the board can say for himself. The board of the present day seem to be imbued with a more humane spirit, and it is felt that a gross injustice has been done to this man, which it is to be hoped will now be rectified. With this end in view I had the pleasure of examining him a short time ago, and found scarcely any alteration in the condition of his heart during the past fifteen years.

Heart—deep transverse dulness 9 inches; $3\frac{1}{2}$ inches to right and $5\frac{1}{2}$ inches to left of mesial line. Impulse in sixth interspace, outside nipple line, strong, and heaving. At apex, first sound dull, accompanied by a short systolic murmur, and second sound

followed by a diastolic murmur. Over the right ventricle, the first sound is more distinct, and at the lower end of the sternum the second sound is followed by a long blowing diastolic murmur, which runs well through the pause, and almost up to the first sound. At the aortic cartilage the first sound is rough, but not loud and not accompanied by any murmur, and the second is followed by a diastolic murmur. At the pulmonic cartilage the second sound is clear and distinct. The other organs are all healthy. Pulse 72, full, strong, soft, and regular; arteries slightly atheromatous.

3 OZS Pressure

PUERPERAL FEVER. By WILLIAM ALEXANDER, M.D., F.R.C.S., *Surgeon to the Royal Southern and Workhouse Hospitals, Liverpool.*[1]

MR PRESIDENT AND GENTLEMEN,—Since the year 1872 I have had charge of the Lying-in of the Liverpool Workhouse Hospital, for a short time as house surgeon, and since then as visiting surgeon. Here the lowest and most depraved women of the city—prostitutes, betrayed maidens, and female derelicts of all kinds—are admitted to be delivered. The wards occupy an angle of the female hospital, and are five in number—a ward where patients sleep when labour is imminent, a ward where they are confined, a convalescent ward, and a ward for washing and dressing babies ; the isolation ward is on the surgical landing, and does not belong to the lying-in. These wards are free from all drain-pipes and water-closets, and are as perfect as the structural arrangements will allow. Scrupulous cleanliness is, of course, maintained ; and the beds of straw are changed for each patient three times. She is delivered on a new bed, with perfectly clean and newly-disinfected bedclothes. She occupies that bed about twenty-four hours, when she is transferred to a similar fresh bed and taken into the recovery ward. Here she stays about eight days, when she passes into the convalescent ward, remaining there at least a week, or until she is quite well. Should any trouble arise at any period of her stay in the lying-in wards she is sent to the isolation ward, but in all cases she is kept under observation by the lying-in department until she goes out of the institution, or to the healthy division. Should she die anywhere in the work-house, even within the year, the lying-in book contains the record.

I mention these facts on account of the statements made by a

member of this Institution before the Royal Commission,—statements that seemed to imply " manœuvring " and " cooking of the statistics " by the house surgeons, nurses, and myself. I have written to this member saying that I was to read this paper this evening, as I would like him to explain before his medical brethren what he meant by the statements he made.

The senior resident medical officer has charge of the Lying-in ; but when he is off duty, the other two residents take it in turn to attend on any emergency when required. A midwife manages the wards directly and teaches the nurses, of whom she has generally six in training, at the same time.

The nurses sent to the Lying-in have nearly finished their training as medical and surgical nurses, and so understand the general principles of nursing before they come there.

Such being the arrangements and staff, I will now describe the result obtained.

In the twenty-six years, the whole time during which the records are available (1868–1893), 8323 women were confined. Of these, 2685 are entered as married, and 5638 are single.

The maternal mortality in or after confinement, from all causes, was 115, and this includes the mortality, no matter where or when the patient died, or from what cause. The diagnosis was generally verified by post-mortem examination ; and where it was not so verified, it is put down as puerperal peritonitis, or septicæmia, whenever there was the slightest doubt about it. The cases are observed with all scientific precision by the nurses and doctors, and the sole desire on the part of everyone has been to state facts, no matter how these told.

Of these, 26 died from septic inflammation, peritonitis, pneumonia, pleurisy, &c., without any distinct cause of origin of the sepsis being ascertained ; 7 died from peritonitis after forceps cases ; 1 from peritonitis after turning ; 2 from peritonitis after removal of adherent placenta ; 1 from peritonitis after a ruptured vagina. In 10 cases the death was directly due to hæmorrhage. One-half of these cases came in moribund through continuous losses for some days previously, some dying a few minutes after reaching the ward.

Epileptiform convulsions carried off 10 patients. One of these died on the way to the ward when I was house surgeon, and I opened the abdomen immediately, but failed to save the child. In another case Cæsarian section was performed with the mother *in articulo mortis*, and the child was saved. A post-mortem examination showed that the mother died from suppurative meningitis.

Two cases died of abscess of the wall of the uterus. In one case a small solitary abscess, the size of a marble, occupied the posterior lip. In the other, multiple abscesses were found in the uterine wall. Both died of pyæmia.

Three cases were septic on admission, the child being decomposed, and the contents of the uterus foul-smelling. The patients sank almost immediately after the children were born. *Three died from erysipelas.* In one the disease originated in an ulcerated leg, the second had had the disease frequently before, and the third was syphilitic. *In four cases, all lock patients*, the subjects of gonorrhœa, &c., *phagedœnic sloughing of the vulva and vagina* set in after labour. In one case the labour had been very prolonged; in another there was some deformity, and the forceps were applied; in the other two there seemed no special reason (except the presence of venereal disease) why sloughing should have set in. *One patient died of phlebitis* and diffuse abscess of leg; *another from pleurisy* set up from a contiguous antepartum axillary abscess; *another from an intrapelvic abscess* in a patient the subject of hip disease.

In three cases the patients were admitted with ruptured uterus, and died from the shock; and one died from shock after a prolonged and troublesome craniotomy. One died from puerperal insanity, two from delirium tremens, and one from irritative poisoning brought on by medicine taken to procure abortion. In this case the stomach and small intestines were acutely inflamed throughout. Inquests were held on these three cases.

In the remainder of the cases intercurrent disease was the cause of death. These were ascertained by post-mortem, and

wherever not so ascertained the case has been included amongst the septic cases.

Eight were delivered of fœtuses in the last stages of phthisis; six were the subjects of heart disease, and all died suddenly, the uterine organs being found normal after death; two died of hemiplegia; two of cancer uteri; two were emaciated to the last degree, and simply collapsed after confinement; two were the subjects of advanced Bright's disease.

Six were delivered in the midst of an attack of acute pneumonia, and succumbed in 24–48 hours after; four were similarly handicapped by capillary bronchitis; one had liver disease and jaundice; one came in with pleurisy in the acute stage.

Each of the classified causes of death here enumerated could be made the subject of an interesting paper, and I have only chosen the subject of puerperal fever because it is the most prolific cause of mortality in the puerperal state, as well as the most preventable. Besides, its nature and source are not yet matters of agreement, nor are the measures for its prevention and treatment uniform amongst medical men.

I do not intend to discuss the various views held by the numerous writers on the subject, but to present to you, as succinctly as possible, my own views, gathered almost entirely from my superintendence of the above wards, and thereby elicit the opinions of some of my fellow - practitioners upon the various points which I intend to raise.

I look upon these cases as a surgeon; and to me the recovery after parturition is an admirable natural and aseptic method of treatment of a wound. The wound is chiefly on the placental seat. It is situated in a cavity that is more or less continuously and actively contracting, so that the discharge from the wound is expelled by a *vis a tergo*, and thus the wound is kept clean. The discharge travels thence to the surface between epithelium-lined walls that do not readily absorb, and the secretion from which tends to promote asepsis, and on coming to the surface the discharge is absorbed by and dries on the clothing.

During the progress of a perfectly natural labour, the child

and placenta are expelled without there being any possibility of air or aerial substances entering from the outside, the walls of the uterus and vagina always closing behind the contents of the uterus as these are expelled. This process, when natural, is proof against the most adverse conditions, and mothers have been delivered with perfect safety under conditions in which puerperal fever should have occurred.

The happy event braces up the mother's nervous and muscular system so that all her organs act as organs generally do under similar circumstances. The application of the baby to the breast serves to keep up the uterine contraction, and if I went over, in detail, all the circumstances of a happy delivery, it could be shown how the means are admirably adapted towards a success-ful issue. So that labour, *per se*, as has been often said, should have no mortality.

But, to ensure this end, the machinery must be perfect and work well. The uterus must keep contracting sufficiently, the uterine wall, and the wound area especially, must not break down too extensively, the passage to the external air must be free from wounds and abrasions, and the discharge must not be obstructed and dammed up in its course, and on coming in con-tact with the external air it must not be polluted with any virulent poison that will be able to inoculate with its malignancy the lochial stream up to its fountainhead, and be absorbed either there or by the abrasions and wounds lower down. For the lochia is one of the most excellent breeding media for septic poison that we know, and the temperature is such as to favour a rapid growth once its inoculation is accomplished.

Probably in all cases its absorption produces fever, even when its contained germs are the most innocent; and when the pollu-tion of the stream is greater, the danger of puerperal fever increases *pari passu.* I have seen most foul discharges coming away from patients without a trace of fever. This was because there was no absorption. Again, apparently sweet lochia coex-isted with high fever. This was due to absorption being free; so that puerperal fever is, to my mind, a surgical fever dependent on several conditions, one or more of which may cause it, but

which often depends on several favouring circumstances, of which sometimes one and sometimes another may be the chief inducing cause.

The causes, capital and contributory, to which I refer are,—

1. Imperfect or infrequent uterine contractions, either due to depressing or disturbing emotions, debilitated, diseased, or badly formed uterine muscles, or excessive injury of uterus by the labour.

2. The lochia may be abnormal through breaking down of uterine tissue, excessive remains of placenta, pieces of membranes left behind, or breaking down of blood-clot in debilitated patients.

3. Abrasions of uterine tissue either in the uterus or at the cervix, vaginal and perineal wounds.

4. Partial obstruction of passage by a flabby, folded uterus, premature closing of cervi uteri, or anything that obstructs the lochial flow at the outlet from the vagina.

5. Septic contagion from other febrile puerperal patients, which is carried most readily by nurses and attendants.

6. Digital and instrumental interference materially increase the risk by interfering with the admirable arrangements of nature, by the direct violence of the hand or instrument, and by the increased danger of direct infection from the hand or instrument. The necessity for manual or instrumental assistance, *per se*, betokens an additional gravity in the case.

7. The eruptive and continued fevers may be indirectly productive of puerperal troubles, but I do not think it is proved that they will produce any special puerperal fever.

We would not, certainly, welcome any of these in the Lying-in room, not only for the inherent risks of these diseases should the puerperal patient contract them, but for the risk of interference with the natural puerperal convalescence through the patient passing through an attack of another fever.

But that a puerperal patient, without contracting, say, scarlet

fever, is influenced by the mere proximity of a scarlet fever case, is an assumption of which I have not yet met with any proof; yet I have known medical men, who were so unfortunate as to lose a patient by puerperal inflammation, search diligently for a source of contagion of this kind; and when they found the remotest possible evidence of it, draw a sigh of profound relief, as if the whole thing was settled. The attention of friends is, at least, diverted; and perhaps this is the object desired. In surgical wounds that go wrong after operation, we do not, however, look for this contagion and shifting of responsibility: we open up the wounds and clear them out, knowing that the source of trouble lies there. I have known a mother confined in the midst of a family ill with scarlet fever, two of which occupied the same bed, yet she never had the slightest trouble from the proximity of the fever, simply because she did not catch the fever.

I performed an abdominal section on a patient of Dr Johnson's of Birkenhead some years ago. The patient caught scarlet fever a few days after, and went through the attack without any ill consequence to the wound or peritoneum,—cases that show that the proximity, even the presence in the blood, of scarlet fever has no detrimental effect on the peritoneum.

I do not mention these matters to induce others to pay slight attention to the surroundings of the patient, or to imply that a medical man may attend contagious diseases and puerperal cases promiscuously and with impunity. As a surgeon, when any of these diseases presents itself, I pass by on the other side, and the very name of erysipelas, diphtheria, and bad house-drainage makes me feel a cold chill. But when these contagious diseases present themselves, they mostly come in their true guise, manifesting their own individuality, and only indirectly producing puerperal fever. On the other hand, puerperal inflammations are septic or pyæmic, and obey the laws of these diseases in their origin, spread, and methods of contagion, and are to be treated as such, and valuable time must not be frittered away in a vain inquiry while the disease is allowed to gain ground.

The influence of imperfect uterine contractions, of poisonous

lochia, of breaches of continuity in the utero-vaginal tract, of stasis of the lochial stream, and of infection from febrile puerperal women, are too well known to require further attention in this paper: numerous illustrative cases of each could be drawn from the statistics before given, were it necessary.

Nor need I describe the different phases by which puerperal fever is manifested. Amongst the chief phases noticed by me have been—1. The septic intoxication that attacks some cases, recognised only by the high fever, and where the patient complains of nothing but heat and headache. 2. Peritonitis, that sets in with the classic symptoms of that disease. 3. Peritonitis, the symptoms of which are latent sometimes till the disease is far advanced, sometimes it is not discovered till the post-mortem. 4. Localised peritonitis, limited to the pelvis, or to the neighbourhood of one or other of the broad ligaments. 5. Then the peritonitis may be purulent or plastic, may be accompanied by distension or collapse of the intestines, by constipation or diarrhœa, by the very fatal sign of diminution or cessation of secretion of urine. 6. Then we have, more rarely, metritis. 7. Very frequently the lungs and pleura are affected in the course of the peritonitis, and sometimes these organs bear the brunt of the septic infection, and are more involved that the peritoneum. 8. Phlebitis seems a more rare disease than formerly, and brain infection is unknown amongst our post-mortem examinations.

The contagiousness of puerperal fever is undoubted, and seems to point to a specific fever rather than to simple septic infection. But when we remember the state of affairs in surgical wards in pre-antiseptic times, our belief in the resemblance of puerperal fever to the surgical fevers that occurred then is strengthened to certainty. Septicæmia and pyæmia spread from bed to bed with fearful rapidity, and the mortality was sometimes dreadful. It was carried from bed to bed, perhaps by the air, but chiefly by the attendants; and so is puerperal fever carried. I have proved this several times. A patient becomes feverish, and is isolated. Perhaps next day another patient is delivered in the Lying-in ward, and she could have no connection with the febrile

one, except by the attendants. By disinfection of the nurses the infection is generally destroyed, but sometimes febrile temperatures have kept up in spite of disinfection and isolation, and have ceased when the nurses were changed. After a febrile case or two, I now send away the nurses for a day or two, and leave the patients only in charge of the midwife, and the effect is most satisfactory, and, I believe, necessary.

The infection in the first febrile case in wards that have been a long time healthy may be imported, but this is not necessary. A woman may, and practically often does, develop puerperal fever spontaneously, or by auto-infection. I have seen a patient become a little feverish, and in a short time all the symptoms disappeared, and she convalesced perfectly. The next case delivered, or another contiguous patient convalescing, becomes a little more feverish than the first, but also soon gets well. The third febrile patient causes some anxiety; and if we allow the process to go on, we can soon develop fatal or even malignant puerperal fever.

The prevention and treatment of the disease is the most important; and of the two, prevention is paramount.

I will now describe the precautions taken at Brownlow Hill to guard against septic infection.

The patients are, if possible, bathed, or at least washed all over, and the genitals especially well cleansed and rendered antiseptic by carbolic lotion. The vagina is douched with perchloride of mercury, solution 1-2000, and the hands of the nurses cleansed by soap and water and by perchloride lotion— a basin of perchloride is kept at the bedside, into which the nurses dip their hands frequently. Digital examinations are avoided as much as possible, and the patient is kept covered to avoid chills; the room is warm, but well ventilated.

When the child is born, the placenta is allowed to come away of itself, or its expulsion is favoured by gentle pressure, but forcible expulsion is not allowed to be practised by the nurses, the doctor being called in if any difficulty arises. At one time a nurse practised the forcible expulsion in a very energetic way, and some mortality took place before it was found out that she

exercised so much force. The placenta is allowed to come away gently and the membranes to flow out; all snatching and tearing are avoided. The placentas are kept just as they were expelled until examined by the house surgeon or myself, who sees that the membranes are entire, and that nothing is missing.

The vulva is now cleaned with an antiseptic, carbolic or per-chloride, and an antiseptic cotton-wool napkin applied. A pad and binder are firmly put on the abdomen, and the patient warmly covered up. The napkin and cotton-wool are changed frequently, and these are never tied on firmly. I have seen the napkin so firmly tied on that the vagina was sealed by the labia being compressed over it, and the discharge flowed out in abundance each time the napkin was removed. The vulva is washed with an anti-septic each time the pad is changed, but this is done without dis-turbing the patient more than is necessary. Formidable routine, frequent washing, and exposure do more harm than good. The diet is simple, the ward is kept quiet, and no visitors are ever allowed during the first week. By this means we restrict the sources of contagion from outside as much as possible, and we keep the patients free from the influence of exciting or depress-ing news. The bowels are moved on the third day, after which solid food is allowed. The patient gets up on the eighth day and passes into the convalescent ward. We keep the patients in for at least a fortnight after confinement, except in some special cases, where the patients go out at their own risk before the time, but we generally keep them longer if they do not wish to go out. They are never sent out against their wish; and if they have nowhere to go, they are transferred to a particular division of the workhouse set apart for such cases.

Such is the uneventful history of nearly all, 96 per cent., of our cases. The remaining 4 per cent. give us cause for anxiety in various ways.

A small increase of temperature, say to 100°, ephemeral in its nature, and without symptoms, is ignored. A free movement of the bowels, or the action of the skin under the influence of liq. am. acet. and ergot, or the advent of milk to the breasts, often shows the cause and cure. When the temperature goes up to over

100°, and is accompanied by any symptoms; or if it keeps up for some hours, then the patient is removed to the isolation ward, and the house surgeon and a gynæcologically trained nurse take charge. The bowels are moved; liq. am. acet. and ergot are often administered to make the skin act and the uterus contract. Quinine, and antipyrin, quinine especially, are our sheet-anchors for pyrexia. Various other medicines are used, according to the symptoms.

The vagina is douched out by the nurse at intervals according to the necessity, and the uterus is washed out by the house surgeon by means of Bozman's or other intra-uterine tubes. He uses perchloride of mercury, or carbolic acid, or sometimes Condy's fluid, according to his predilection or the special indications of the case. As soon as the symptoms begin to abate, the intra-uterine douche is discontinued, for continuous douchings of this kind often keep up the temperature to 102° or 103° indefinitely, and it is necessary to stop when the original cause of the pyrexia is removed. In a few days the temperature subsides of itself.

During this time the patient is carefully watched for local manifestations of inflammatory trouble, and the place where suppuration points are incised without delay. A deep incision into the brawny thickening that often appears on either flank often dissipates in a marvellous way both the fever and the thickening, although no pus may have been obtained by the incision. The opening of localised abscesses, either through the abdominal wall or the vaginal wall, is a most satisfactory proceeding. A few times I have opened the abdomen in diffuse peritonitis, and washed out the inflammatory products, but I cannot recommend the procedure as affording any chance of saving life. Whether operation in an earlier stage would be more effectual is a question not likely to be decided soon: so many patients with early symptoms recover that we might easily get into discredit by recommending such an operation in a patient not as yet seriously ill.

Dr MACFIE CAMPBELL congratulated Dr Alexander upon his results, considering his material in the workhouse.

Dr Campbell had recently absolutely forbidden nurses to use douches. The only cases of puerperal hyperpyrexia he had in his own practice were due to the careless use of douching by the nurses.

Dr Campbell considered that a legitimate speciality is a midwifery one, and that the midwifery practitioner should avoid as far as possible attending infectious diseases. He had himself given up attending scarlatina and erysipelas for many years—not an easy or remunerative course to pursue, but one which adds much to the mental quietude of the practitioner.

Dr T. B. GRIMSDALE said that he would prefer to get rid of the name Puerperal Fever; for although it was time-honoured and in general use, yet it was responsible for a vast amount of mystery and superstition. The term Puerperal Fever, he thought, was too comprehensive; it included a large variety of pathological conditions under one heading, leading to endless confusion. Under the term Puerperal Sepsis, or Puerperal Septicæmia, the ground would be cleared, and some definite idea arrived at as to what was to be included under the heading. At present puerperal fever might mean any rise of temperature during the lying-in, or it might mean some dread specific disease which, according to some authorities, was peculiar to lying-in women, having origin from scarlet fever, typhus fever, erysipelas, &c., &c., but which, becoming modified in the puerperal woman, gave rise to puerperal fever.

All these theories, and many more, would be swept away, and the treatment infinitely simplified and made more satisfactory, if the term Sepsis were used in place of puerperal fever.

It was owing to the recognition of this fact that puerperal fever was fast disappearing from the lying-in hospitals.

Dr BRIGGS had listened with pleasure to the views of an operating surgeon on puerperal fever, and he thought, allowing for differences in site, the surgical fevers were typically represented by the puerperal fevers. He held that the traumatism in precipitate labour and in operative midwifery ought to be

considered in relation to subsequent asepsis, and here an intra-uterine douche, given immediately after the labour, secured what many subsequent douches might never accomplish. During the puerperium, delay in recognising the symptoms which mark the onset of the most severe cases, where nervous symptoms are often prominent, frequently led to dissatisfaction with, or failure in, the treatment. Hence the douche is blamed, because it was not given at the proper time.

Dr GEORGE JOHNSTON, referring to the remark of Dr Mac-alister that he must join issue with Dr Alexander on the question of no danger to puerperal patients from contact with scarlatina, said that he took Dr Alexander's meaning to be, not that we were to be careless about allowing such contact, but rather that we were not to be satisfied that the existence of scarlet fever in the proximity of the patient was the cause of the puerperal fever. In support of Dr Alexander's contention, he mentioned the case of a child, eighteen months to two years old, who took scarlet fever a few days after its mother was confined, and could not be removed, with the result that both were nursed on the same bed, and the mother did not take puerperal fever. Also the case of a woman who, three days after confinement, developed scarlet fever and no puerperal fever.

On the question of general prevalence of puerperal fever, he agreed that puerperal fever was rare in the practice of medical practitioners, but he did not think it was so in midwives' practice. During one summer he had been called to see three puerperal cases in a moribund condition, and refused to attend them. All died, and he knew the houses were not disinfected, therefore they had not been certified as puerperal fever. He had a case running now that was attended by a midwife, and seven days were allowed to pass before aid was called in, and then not by the midwife, but by the patient's relatives.

What he thought was, that few of the midwives were able to recognise the early symptoms mentioned by Dr Briggs, which indicated the need for the douche, and that those responsible

for the training of midwives should see that the point was well attended to.

Dr HOPE:—There were 17,758 births last year in Liverpool, and 18 deaths were registered amongst women from puerperal fever during the same period. The midwives in these cases are prohibited for a certain time from following their employment.

THE CORONERS ACTS OF 1887 AND 1892. ADVANTAGES TO CORONERS OF A MEDICAL TRAINING. By FREDERICK W. LOWNDES, M.R.C.S. Eng., *Senior Surgeon to the Liverpool Police.*

On the 16th September 1887 the Act to consolidate the law relating to coroners, better known as the "Coroners Act, 1887," was passed. It was followed by another Act to amend the law in relation to the appointment of coroners and deputy-coroners in counties and boroughs. This Act was passed on the 28th June 1892. These two Acts, though containing much that is extremely interesting and important to all medical practitioners, are by no means so well known to them as they should be. Having had for many years past unusually good opportunities of studying the laws relating to coroners, both before and after the passing of these Acts, I purpose, in this paper, to give those who have not similar opportunities such information from these Acts as shall be both useful and profitable. I also propose to add some remarks on the subject of medical *versus* legal coroners.

That the Coroners Act of 1887 was needed may be judged by the fact that it repeals partly or entirely no fewer than thirty-three former Acts of Parliament, from the 3 Edw. I. c. 9 to the 45 & 46 Vict. c. 50. In other words, the coroners of England and Wales acted, previously to the passing of this Act, upon laws passed just six centuries ago! It is not surprising, therefore, that "coroners' quest law" should have become somewhat antiquated, and that an Act bringing all these numerous statutes into something like harmony with the present age should have been imperatively needed. Now, the 1st subsection of the 3rd section of this Act is of so great importance to all those medical practitioners who are required from time to time to give certificates of the cause of death that I reproduce it in its entirety:—

"Where a coroner is informed that the dead body of a person is lying within his jurisdiction, and there is reasonable cause to suspect that such person has died either a violent or an unnatural death, or has died a sudden death of which the cause is unknown, or that such person has died in prison, *or in such place or under such circumstances as to require an inquest, in pursuance of any Act,* the coroner, whether the cause of death arose within his jurisdiction or not, shall, as soon as practicable, issue his warrant for summoning not less than twelve nor more than twenty-three good and lawful men to appear before him at a specified time and place, there to inquire as jurors touching the death of such person as aforesaid."

This is very important, since it specifies, with some approach to precision and accuracy, the cases into which every coroner must inquire. It is of great importance to all medical practitioners, as indicating those cases in which a medical certificate of the cause of death ought not to be given. It is obviously desirable that there should be cordial relations between medical practitioners and coroners in order to ensure the correct registration of every natural death, and a proper inquiry into every death which comes within the meaning of the words in the above section.

Now, in many cases of violent death, the medical attendant is not even asked for a death certificate, the death being reported to the coroner by the police or others as a matter of official duty, an inquest following as a matter of course. But there are other cases where death may be the result of violence, though remotely,—death not occurring till, it may be, weeks or even months after the alleged violence. In all these cases it is the duty of the medical attendant to withhold his certificate until after communication with the coroner, whose duty it is, under the statute (probably referred to in the words in italics in the subsection given above), to inquire into any death within a year and a day after the receipt of an injury. It does not necessarily follow that an inquest will be held: this rests with the coroner, who may, if he is

satisfied that the death, though following an injury, is really a natural one, consider an inquest unnecessary, and allow the death to be registered on a certificate in the usual manner.

Unnatural deaths are also specified as those into which the coroner is to hold an inquest. There are numerous deaths which, though not the result of violence, including by this term death from poison, are unnatural. For instance, death from chloroform or any other anæsthetic cannot be regarded as natural death, nor are deaths from delirium tremens or alcoholism natural deaths. The death of a woman in childbirth as the result of neglect, of a child from improper or insufficient feeding, and many other deaths which need not be specified, but which every practitioner can call to mind, come under this class of unnatural death. In all these a certificate should be refused, and the case should be referred to the coroner.

" A sudden death of which the cause is unknown " is also given as one into which the coroner should hold an inquest. Before this Act was passed every sudden death had, strictly speaking, to be referred to the coroner, the old quaint statute of the reign of Edward I. being, " The coroner, upon information, shall go to the places where any be slain, or suddenly dead," &c. In those days a sudden death was presumably a violent or an unnatural death, and was almost invariably inquired into; now we see this is not so,—a sudden death, the cause of which is known, may be certified. But, as a matter of precaution, and to avoid any difficulty with the registrar, it is better to inform the coroner of the death, and to state the cause. Even with the law modified as it now is, and giving, inferentially, a permissive power to certify to a sudden death of which the cause is known, it is better for medical practitioners not to take upon themselves the *legal* responsibility of certifying to a sudden death. For although a coroner is not bound to hold an inquest in such cases, he is not by this Act deprived of his right of instituting an informal inquiry should he choose to do so. Moreover, a sudden death from heart disease, from Bright's disease, from diabetes, or any natural cause, bears a very different appearance to the mind of a layman from that which it has to an experienced medical

practitioner. For instance, a man may have been attended for some time for heart or lung disease, but have been able to go about, and even follow some light occupation. Suddenly a rupture of some blood-vessel takes place, and the patient dies almost immediately. The medical attendant gives a certificate, but some relative or friend, seeing blood oozing from the mouth or nose, informs the registrar, who in his turn informs the coroner. Even if an inquest does not follow, much annoyance will be caused; and as the result of twenty-five years' experience, I would advise medical practitioners not to certify to a sudden death without first informing the coroner. I would also add this: Whenever there is the slightest doubt in the mind of the medical attendant as to the propriety of giving a certificate of the cause of death, it is better not to give one, but to refer the deceased's relatives to the coroner. Reference to the coroner does not necessarily mean an inquest, but a certificate given carelessly or unguardedly may involve not only an inquest but much more.

It will be seen that the coroner's functions extend to any dead body lying within his jurisdiction, whether the cause of death arose within it or not. It has happened that bodies, and even dying persons, have been removed from one coroner's district to another, involving some difficulties. The following are illustrative cases.

In the case known as the Penge murder, the unfortunate victim, Harriet Staunton, was removed while in a dying state to a place at some distance from the house in which she had been residing. This fact, added to others, led to an inquest being held. The object of the removal was probably to prevent the real truth from being known.

In the case known as the Carlisle poisoning case, the unfortunate deceased, a newly married bride, was taken ill on her arrival at Edinburgh, and died shortly afterwards from poisoning. The body was examined, and the medical attendants satisfied themselves that some irritant poison was the cause of death. But the fiscal was not informed, as he should have been, and the body was sent back to Carlisle for interment. The case

had created much stir, and an inquiry was demanded. But a deadlock occurred. The Edinburgh fiscal could not inquire, as the body had been removed out of his jurisdiction; the coroner for Carlisle could not hold an inquest, as the death took place out of his district. Ultimately, some ham of which the deceased had partaken was examined, and found to have been the cause of her death, and of serious illness in some of the other persons present at the wedding breakfast.

On the 25th January 1883, Margaret Jennings (one of the victims of the notorious women Flannigan and Higgins) died, and was buried two days after in the Ford Cemetery. In the following November I was asked to examine the body, which it was proposed to exhume. The death of the girl took place in the district of the city coroner (the late Mr Clarke Aspinall), but the body lay within the jurisdiction of the county coroner (the late Mr Barker). An order was obtained from the Home Secretary permitting the exhumation of the body and its removal to the Prince's Dock mortuary, which is within the city boundary. It would have been much more satisfactory to have had the inquest near the cemetery, as well as the viewing of the body and the autopsy within the cemetery itself. This latter was done with the bodies of John Flannigan and Mary Higgins (two other victims), on which no inquest was held, the bodies being immediately reinterred after the completion of the autopsies.

I was also present a few years ago at the exhumation of the body of a gentleman who had died in London, but whose body had been buried in a Liverpool cemetery. Rumours of foul play had arisen, and the body was exhumed. Had these rumours been verified, the inquest would have been held by the city coroner. Obviously, this is a better arrangement than removing the body backwards and forwards for, it may be, a considerable distance.

I pass on to section 21, which deals with medical witnesses and post-mortem examinations. It is slightly altered from the Medical Witnesses Act, 1836, but its provisions are precisely the same. The only remark which need be made is that,

though the coroner's order may include an analysis of the
contents of the stomach or intestines, no medical practitioner
need undertake this unless he wishes to do it, and feels perfectly
competent to do so. The coroner can always command the
services of a competent analyst, who will be properly re-
munerated for such a difficult and responsible duty; while,
should there be any difficulty, the Home Secretary may be
relied upon to set it right.

Section 22 deals with the important subject of fees to medical
witnesses, which are still as heretofore. Subsection 2 is so
important, and has been made the subject of such diametrically
opposite legal opinions, that I give it verbatim :—

"Where an inquest is held on the body of a person who has
died in a county or other lunatic asylum, or in a public
hospital, infirmary, or other medical institution, or in a building
or place belonging thereto, or used for the reception of the
patients thereof, whether the same be supported by endowments
or by voluntary subscriptions, the medical officer whose duty
it may have been to attend the deceased person as a medical
officer of such institution as aforesaid shall not be entitled
to such fee or remuneration."

Now, this section repeals section 5 of the Medical Witnesses
Act, 1836, which, as it is different in several expressions, I give
also in full. I have given in italics the words changed :—

"*Provided also, and be it further enacted, that when any inquest
shall be holden* on the body of any person who has died in any
public hospital or infirmary, or in any building or place belong-
ing thereto, or used for the reception of the patients thereof, or
who has died in any county or other lunatic asylum, or in any
public infirmary or other public medical institution, whether the
same be supported by endowments or by voluntary subscriptions,
*then and in such case nothing herein contained shall be construed
to entitle* the medical officer whose duty it may have been
to attend the deceased person as a medical officer of such
institution as aforesaid to *the fees* or remuneration *herein
provided.*"

Both these sections have been the cause of much heart-

burning in those whom it chiefly affects,—viz., the resident
medical officers of hospitals and infirmaries, who are thus
compelled to perform gratuitously many post-mortem examina-
tions for coroners, as also to attend inquests and to give
evidence also, gratuitously.   The late Mr Thomas Wakley,
M.P., to whom we are indebted for the Medical Witnesses Act,
prior to which medical witnesses received no remuneration
whatever, either for attending inquests or for making post-
mortem examinations, was compelled to accept this clause
in order to save the bill, which would otherwise have been
lost.   The case, however, of workhouse medical officers was
wholly different, and it will be seen that workhouses are not
included in either of the above sections.   Within the last few
years some coroners have demurred to paying the usual fees to
the medical officers of workhouses for inquests and for post-
mortem examinations.   A *test* case was taken before the
County Court Judge of Croydon, and was decided against the
workhouse medical officer.   Unfortunately, this case was not
carried to a higher court, as it ought to have been.   But Mr
Poland, Q.C., one of the most eminent counsel of the day, has
given as his opinion that the above section does not apply to
workhouses and their medical officers.   Who shall decide this
fine legal point when barristers disagree?   Who shall determine
the meaning of plain English words when lawyers differ?

A workhouse is not a public hospital or infirmary in any
sense of the word.   It is not endowed, nor supported by volun-
tary subscriptions.   It is an institution for the reception of
paupers, supported by the parish rates,—the inmates being sent
to sick wards, workhouse hospital, or infirmary as more con-
venient than that they should be altogether without classifica-
tion.   It is not a medical institution, nor an asylum.   For these
reasons, Mr Poland's opinion seems certainly to be founded on
common sense, and this is strengthened by precedents.   In the
instructions issued to the poor law medical officers, it was dis-
tinctly laid down that they were not bound by their office to
make post-mortem examinations, nor to give evidence at coroner's
inquests without remuneration from the coroner.   Again, in

Liverpool, the present coroner, following the practice of his predecessors, the late Messrs Clarke Aspinall and Philip F. Curry (in whose coronership the Medical Witnesses Act was passed), always pays the usual fees to the medical officers of the Liverpool Workhouse and of the Mill Road Infirmary of the West Derby Union. These payments have been sanctioned by the city auditor, and it is inconceivable that all this would have been done had these payments been illegal.

I have no hesitation in stating that all workhouse medical officers are entitled to the usual fees from the coroner, both for giving evidence and for making post-mortem examinations; and if they do not obtain them, it will be their own fault. The Medical Defence Union has done very good work in this direction, aiding a workhouse medical officer in recovering fees from a coroner who had declined to pay him.

The Coroners Act of 1892 is a very short one, contained in two pages, and comprising only three sections. Its effects will be better understood by a glance at the state of matters which prevailed previous to its being passed.

1. A coroner could not resign his office, however he might wish to do so. It was literally a life office. When the late Mr Driffield, for many years coroner to the West Derby Division of Lancashire, wished to resign, in consequence of ill-health, an old Act of Parliament, " De coronatore exonerando," had to be put in force.

2. The deputy of a coroner could not act after the death of the latter, and some neighbouring coroner had to be pressed into the service, much to his inconvenience and that of all concerned.

3. The coroner's qualification was that of "any fit person," but the deputy-coroner of any municipal borough was required by the Municipal Corporations Act to be a barrister or solicitor.

4. The elections of borough coroners were required to take place not later than ten days after the death of the coroner.

It seems almost incredible that such anomalies should have existed so recently. Some years ago the coroner for Anglesea died; and as no one could be found to hold an inquest on the body of a man who had died from an accident, it was, after considerable delay, buried without inquest. A boy died in the Children's Hospital at Nottingham ; and as the coroner was recently dead, it was proposed to wait until the appointment of his successor, to which proposal the medical officers strongly objected. Ultimately, the mayor acted as coroner, and the body was buried.

The Act of 1892 remedies all these anomalies. The resignation of a coroner is evidently implied by the words "notwithstanding the coroner vacates his office, by death or otherwise." The deputy of a coroner may act after the death of the latter until a new deputy is appointed. A council may postpone the appointment of a coroner to fill a vacancy, either generally or in any particular case, for a period not exceeding three months from the date at which that vacancy occurs. This will prevent hasty elections, besides proving in other respects a great improvement on the old state of matters, as I have described them. The deputy may now be " a fit person, approved by the chairman or mayor," without any limitation of the office to a barrister or solicitor. Thus the office of deputy borough coroner may now be held by a member of the medical profession. I shall allude to this important change further on.

I have now come to my last point—that of medical *versus* legal coroners. Though I always felt that those who supported medical candidates for the office of coroner had a very strong case, I kept a comparatively open mind on this point until I was myself asked to become a candidate for the office in the room of the late Mr Clarke Aspinall. I felt that it was due to my professional brethren to show that they had at least some grounds for the opinion which they expressed in the resolution carried unanimously at the Medical Institution on the 17th December 1891 :—" Considering the nature of the coroner's duties, this meeting of the Liverpool Medical Institution is of opinion that they can be more efficiently performed by a medical man, who

has thoroughly acquainted himself with the legal bearings of medical questions, than by any gentleman who has not had the advantage of a medical training." I endeavoured to do this in a paper which I published more than two years ago, entitled " Reasons why the Office of Coroner should be held by a Member of the Medical Profession." In this I dealt fully with the ques- tion; and if I may judge from the letters I have received, it has been of some service to successful medical candidates for the office of coroner. It is quite unnecessary for me to repeat what I there stated, since those who have read the preceding pages will have seen very convincing reasons why every coroner should have had a medical training. It will have been observed that the decision as to whether there is reasonable cause to suspect that any deceased person has died an unnatural death (or, pre- sumably, a natural one) is entirely at the discretion of the coroner. He it is, also, who must decide whether the cause of a sudden death is or is not unknown. It rests with him to say whether there shall be an inquest or not; and should an inquest be held, whether medical evidence should or should not be called. It will hardly be contended that a solicitor or barrister, who has had no previous medical training, is as competent to decide such questions as an experienced medical practitioner, who has had to attend many an inquest, to make many post-mortem examinations, and to give many certi- ficates of the cause of death. That a comparatively moderate legal training is all that is required may be judged by an examination of the inquests held by the city coroner for the year 1893, which may be taken as a fairly typical one. Inquests were held on the bodies of 563 males, 394 females,—total, 957. Of these, 5 ended in verdicts of murder, 7 of manslaughter, —together, 12, or 1·25 per cent. This confirms very remarkably what was stated by the late Dr Lankester, coroner for Central Middlesex, that only about once in every three hundred cases did any legal question arise; while his predecessor, the late Mr Thomas Wakley, the first medical coroner, asserted that all the law necessary for a coroner could be learnt in one day. Return- ing to our table of inquests, it appears that there were 41 cases

of "suicide"; 312 of "accidental death"; 42 from "injuries, cause unknown"; 171 infants "suffocated whilst in bed with parents or others"; 26 "found drowned"; 196 "excessive drinking"; "natural causes," 124. There were some few more, which need not be specified.

Now, these figures show clearly that the coroner's functions are medical rather than legal—to ascertain the cause of death first, and next how it was caused. All these inquiries into accidental deaths, deaths from suicide, deaths from injuries, come most appropriately within the province of a medical coroner, while it becomes a grave question whether he would not be able to reduce considerably the number of inquests resulting in verdicts of deaths from natural causes. In making these remarks I make no reflection upon our city coroner, Mr T. E. Sampson, or his deputy, Mr Gibson, whose courtesy and deference to medical practitioners are beyond all praise. I am simply arguing that the office of coroner is one which is fairly open to the medical profession, practically as well as legally. Any fit person may now be a candidate for any vacant office of coroner, or of deputy-coroner. Meanwhile, I repeat that it is the duty of all medical practitioners to endeavour to work heartily and loyally with every coroner, whether he be a legal or a medical one.

TWO CASES OF CHOLESTEATOMATA, COMPLICATING CHRONIC SUPPURATIVE OTITIS MEDIA, WITH REMARKS.

By WILLIAM MILLIGAN, M.D., *Assistant Surgeon to the Manchester Institution for Diseases of the Ear; Lecturer upon Diseases of the Ear, The Owens College.*

ONE of the most interesting and important complications of chronic suppurative middle-ear disease is the formation of cholesteatomata. These masses are found in the tympanic cavity, the recessus epitympanicus, the mastoid antrum, and in the interstices of the mastoid cells. In size they vary from that of a small pea to that of a moderate-sized walnut. As a rule, they are found in cases of old-standing suppurative middle-ear disease, but at times they have been met with in the substance of the mastoid bone when no evidence of old-standing trouble has been forthcoming. In illustration of this may be mentioned a very remarkable case published by Kuhn (*Archiv. of Otology*, vol. xx., No. 4, p. 291), where a patient, aged fifty-one, who for several years had suffered from left-sided tinnitus and vertiginous attacks, suddenly developed, after a severe cold, an acute attack of middle-ear suppuration, accompanied by deep-seated pain. At an operation some days subsequently, a cholesteatoma of unusually large size was removed from the interior of the mastoid process, after the removal of which the sinus lateralis and a portion of the cerebellum, with its coverings, was plainly visible.

The disease is by no means uncommon. Virchow (*Archiv. of Otology*, vol. xix. p. 273) found cholesteatomata present in one-third of the fatal cases of ear disease examined by him. The formation appears as a bright white or pearl-coloured tumour, with smooth surface and of semisolid consistence. If broken up, it is found to be composed of concentric layers of non-nucleated polyhedral cells and cholesterine crystals. No blood-vessels are to be found in or around the substance of the growth.

These masses have the property of causing gradual erosion of
the surrounding bony structures, and, as a rule, are found lying
within a cavity in the bone, lined with a thin membranous
periosteal layer.   As is well known, they are also found in other
parts of the body,—in the brain, the spinal cord, the testicle, &c.
Speculation has for years been rife as to the exact method of
origin of these pearly tumours, and at the present time no one
theory appears capable of explaining the mechanism in all cases.
Virchow (Virchow's *Archives*, 1855, vol. viii. p. 371) regards
them as epithelial neoplasms, composed of concentrically
arranged non-nucleated epidermoid cells, covered by an exceed-
ingly fine capsule.

Von Tröltsch (*Archiv. f. Ohrenheilk*, 1868, vol. iv. p. 97), on
the other hand, regards their formation as being an inflammatory
product from the surface of the mucous membrane of the middle
ear or mastoid cells.   More recent researches, however, especially
those of Habermann (*Archiv. f. Ohrenheilk*, vol. xxvii. p. 42)
and Bezold (*Archiv. of Otolog.*, vol. xix. No. 4), have shown that
when large perforations exist, and especially when the edges of
the perforations become adherent to the mucous membrane lining
the inner tympanic wall, the epidermic cells of the dermic layer
of the membrana tympani gain an ascendency over the cells of
the tympanic mucous membrane, and extend with rapidity over
the adjacent parts.   Thus a migration of epithelial elements
takes place, the cells penetrate into the interstices of the
mastoid antrum and mastoid process, and then, becoming
heaped up, form a cholesteatoma.

Kuhn (*Archiv. of Otolog.*, vol. xx. p. 303), in describing their
formation, says :—" Cholesteatoma of the temporal bone is either
a true heteroplastic tumour, as Virchow believes it to be in
all cases, or it may also develop, in the course of chronic
suppuration of the middle ear, from epidermis which has
grown into the tympanic spaces from the perforated drum
or the external auditory canal, and which has slowly and
continually kept shedding its horny layer, thus forming the
stratified cholesteatomatous mass."

Cholesteatomata may be found accompanying any form of

suppurative middle-ear disease. In my own experience, they have been found much more frequently in cases of attic suppuration than in cases where some other portion of the membrana tympani has been perforated. Bezold has explained their frequency in cases of attic disease as being due to the fact that stratified epidermis is constant behind perforations in this region. In this situation cholesteatomata have a peculiar significance, as the plate of bone separating the atticus from the base of the brain is an extremely thin one, and one readily eroded by the gradually increasing epithelial mass. The diagnosis of the condition is mainly made from observing small flake-like masses of epithelium in the fluids with which the diseased ear has been syringed. Where the perforation is situated in the membrana flaccida, irrigation should be carried out by means either of Hartmann's small intra-tympanic canula, or the writer's reservoir intra-tympanic syringe. With either of these instruments the white flaky masses of epithelium are syringed out, and may, if necessary, be submitted to a microscopic examination. At times, however, the consistence of the mass is so firm that small spoons or scoops require to be used in order to break it up. They may be suspected also in cases where, without any marked inflammatory symptoms, a feeling of fulness and heaviness or a feeling of deep-seated pain is complained of upon the same side as the affected ear. In illustration of this the following case may be cited.

A. E., aged 56, had suffered from severe suppurative middle-ear disease as a boy, and stated that he believed that at one time a growth had been removed from the ear. For many years, however, he had noticed no special inconvenience beyond a certain degree of deafness. During the last few months, however, he had complained of a marked feeling of fulness and pressure upon the left side of the head. This feeling was always aggravated after a hard day's work and after railway travelling. There was no distinct pain, however; no discharge; but frequent tinnitus and occasional vertigo. Upon examination, the hearing power of the affected side was found to measure only
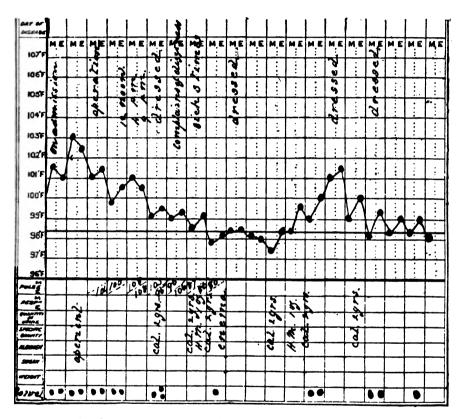
$\frac{1}{20}$th of the normal. The tuning-fork tests pointed to involvement of the left middle ear. The meatus was found almost completely blocked up by a mass of cerumen, after the removal of which a small quantity of puriform fluid was found lying over the membrana tympani. After syringing this away, a polypoid growth was seen in the upper portion of Shrapnell's membrane. This growth was of firm consistence, and exquisitely painful when examined with the probe. After having syringed the atticus with the reservoir intra-tympanic syringe, a number of small epithelial flakes were seen in the outcoming stream of fluid. These flakes were found, upon examination, to be portions of a cholesteatomatous tumour. In addition, the probe revealed bare and denuded bone. The growth was removed under chloroform (and was found to be a myxo-fibroma), and the cholesteatoma scraped and curetted away with small Volkmann's spoons. Recovery ensued, with loss of all previous disagreeable symptoms. The hearing power remained as before the operation.

In other cases, however, the presence of cholesteatomata give rise to serious and painful symptoms,—symptoms which at times are suggestive of commencing meningeal irritation.

B. W., aged 16, had suffered from right-sided purulent middle ear disease for many years, following an attack of scarlet fever.

The discharge from the ear had been fairly profuse and almost constant, but no pain had been complained of until a few days prior to admission to hospital. On admission, the following condition was noted. The face was flushed, the pulse rapid, the tongue furred, and the bowels constipated. The temperature measured 101·6° F. Great pain was complained of in and behind the right ear. A small quantity of extremely fœtid discharge was found in the external meatus. There was no swelling of the tissues over the mastoid process, but pressure elicited marked pain over the region of the mastoid antrum. The posterior superior meatal wall was bulging to such an extent as almost to come in contact with the anterior inferior. A minute fistula, surrounded by a fringe of delicate vascular granulations, was seen

upon the most prominent part of this bulging portion of the
meatal wall; and upon the introduction of a probe, the fistulous
track was found to lead into the substance of the mastoid bone
when exposed and carious bone was readily felt. A minute
canula having been inserted along this track, typical cholest-
eatomatous flakes were syringed out. The mastoid process was

accordingly opened in the ordinary way, and after a good-sized
opening had been made a bright shining cholesteatoma was at
once seen. This was carefully removed by means of forceps and
small curettes. The surrounding bone was eroded to such an
extent as to expose the lateral sinus for ¾ of an inch. The
posterior meatal wall (which was also carious) was chiselled
away, and external meatus, middle ear, and mastoid antrum
thus thrown into one large cavity. This was packed with

iodoform gauze. Repair went on uninterruptedly, and at the present time (now ten months since the operation) no disagreeable symptoms are complained of. The cavity is lined by a smooth layer of epithelial-looking tissue. Regarding the treatment of the condition, lotions may be used to try if possible to soften and disintegrate the mass. Such preparations as bicarbonate of soda (g. xx. ℨ i.), peroxide of hydrogen (ℨ i. ℥ i.) or sulphocarbolate of soda (g. vi. ℥ i.) may be tried. As a rule, however, the mechanical difficulties of reaching and of thoroughly irrigating the complex series of spaces in which the growth lies are of such a nature that some more radical line of procedure must be adopted. The ordinary mastoid operation, or better still, Stacke's modified mastoid operation, usually requires to be performed. It is essential to freely expose the part, so that all epithelial debris may be removed and free access given for the application of remedial agencies. An important point in practice is, as to whether a permanent mastoid fistula should be aimed at, or whether the parts should be allowed to granulate up and so form a solid mass of cicatricial tissue. Seeing that cholesteatomata have an undoubted tendency to recur, it is certainly a point worthy of serious consideration whether we should so conduct the after-treatment of the case as to secure a permanent opening behind the ear, which can readily be inspected, and through which treatment could again be carried out should any symptoms of recurrence manifest themselves. If the fistula be made to form close behind the auricular attachment, hardly any disfigurement is produced, as it is usually hid from view by the growth of the surrounding hair.

INSANITARY PROPERTY, AND ACTION IN REGARD TO IT. By E. W. Hope, M.D., D.Sc., *Medical Officer of Health, City and Port of Liverpool.*

THE property now being specially dealt with in this city under the title of Insanitary Property consists of a special class of dwellings, namely, houses consisting of three rooms placed one above the other, connected by staircases leading directly from one room to the other without any intermediate landing, so that practically the same atmosphere pervades each of the three rooms. The houses, moreover, are back to back and side to side with others of similar structure, consequently there can be no back windows or side windows, nor any through ventilation. The houses also are arranged in courts, as shown on the plans; there is no open space whatever at the rear or the side; there is no water-closet accommodation in them, nor is there any water-supply. The water-supply is got from stand-pipes placed some-where in the court, and the water-closets and receptacles for ashes and other refuse are also placed in the court, either narrow-ing and obstructing the entrance, or placed at the far end of the court, and being for the common use of all the occupants of all the houses in the court. The courts themselves vary in width from 6 to 12 feet; they are approached by a passage which is sometimes built over, converting the entrance into a tunnel, and the court itself into a box, open at the top, from which box the houses, also constructed on the principle of a box, open.

Many of the worst courts are old, having been constructed prior to 1847. The condition of these is ruinous, walls fre-quently bulging and out of plumb, window-sills sunk, brick-work worn, mortar perished, and woodwork rotten; inside, the mortar, ceilings, and floors and other woodwork crumbling to decay, foul smelling and offensive, by reason of prolonged and continuous saturation with organic emanations.

All the property now requiring to be dealt with by the Insani-

tary Property Committee is of the type described, varying in minor detail and varying in degree of repair, but the total number of houses may be roughly estimated at about 10,000. We are not dealing now with cellar dwellings, nor with houses rendered insanitary by defective drains or kindred causes, or by subletting or by overcrowding, but only with those of the type described.

Origin of this Condition.

This admits of simple explanation. The growth of the city in the early part of the century and the development of Liverpool into a great national seaport was exceedingly rapid. The trade of the country centred upon a narrow river frontage, and this trade required for its proper conduct labourers who, with their families, needed to live as near their work as possible. Unlimited trade and the prospects of work were constantly drawing additional labour, while the area for habitation was restricted, and increasing congestion of the population was the result. No control was exercised over the erection of houses,— every builder or landowner did as he liked; the resulting evils, however, led to an Act of Parliament which came into operation in 1842, and which was called " An Act for the promotion of the Health of the Inhabitants of Liverpool." This Act, however, did not control building. So far as building was concerned, the agitation caused the evils to be aggravated, for the builders of the day anticipated further legislation by erecting some 1000 or more additional courts, each with an average of 6 to 10 houses, thus leaving a still heavier burden for the future generation to meet. In 1847 an Act controlling the erection of courts came into force; and in 1864 such buildings were practically stopped, and provision made for open spaces in the rear of houses, thus securing a certain amount of good, unobstructed ventilation, back and front.

The Past Action of the Corporation in regard to this Property.

The construction of court houses was not practically put an end to until 1864. Between that and the succeeding ten years

attempts were made to remedy the evil they produced by removing here and there certain houses which were not necessarily in themselves insanitary, but which blocked the light and ventilation to others. Courts were opened up in the denser parts of the city, and iron railings substituted for walls, in order to facilitate light and ventilation.

The local Act of 1864 empowered the Medical Officer of Health to take action in regard to any houses which he might deem unhealthy in themselves, or which, by reason of their situation or condition, rendered other property dangerous or insanitary.

In 1875, under the special powers conferred by Cross' Act of that date, a large area, namely, the area of Nash Grove, was scheduled by the late Dr Trench as insanitary, and action was taken upon his representation, which resulted in the opening of the Victoria Buildings on that site in the year 1883.

From that time forward insanitary areas very much smaller in size have been dealt with year by year, the number of dwellings of the character described which have been demolished since 1884 being 2860—an annual average of 286.

The *legal powers* under which action may be taken at the present time may be briefly summarised as follows :—

1. The "Housing of the Working-Classes Act," of 1890. This is a general Act, and consolidates and amends all the Public Acts relating to artisans and workmen's dwellings, and to the housing of the working-classes. It is divided into several sections, but it is only necessary to refer to two of them now, viz.—

Part 1, which deals with unhealthy areas.

Part 2, which deals with unhealthy dwelling-houses.

The remaining sections I need not trouble you with.

The scope of Part 1 is to provide for a *scheme* being made by a Local Authority for the demolition of property within a given area, and for the erection thereon of dwellings for the working-classes dispossessed by the scheme. The Local Authority is set in motion by an official representation made to it by the Medical Officer of Health, and this representation may be made *either*

because the houses, courts, or alleys are themselves unfit for human habitation, or because their narrowness, bad arrangement, grouping, want of light and air, &c., render them injurious to the health of the inhabitants, and because these evils cannot be otherwise dealt with than by reconstruction.

When the Local Authority have given due notice of such representation to owners, the sanction of the Local Government Board is required, authorising the scheme to be carried into execution. When this authorisation is obtained, it becomes the duty of the Local Authority to purchase the properties required for the scheme, and carry the scheme into execution as soon as practicable. The Local Authority themselves may rebuild, with the sanction of the Local Government Board, or any other persons may carry the scheme into effect by agreement with the Local Authority.

If the amount to be paid to the owners of the property cannot be agreed upon, compensation is to be settled by arbitration.

With regard to Part 2 of this Act, this provides for the closing and demolition of buildings which are unfit for human habitation, for the removal of obstructive buildings, and for the improvement of areas too small to be dealt with under Part 1.

An order, called a "closing order," is to be in the first place obtained. This is obtained under the Public Health Act on complaint made to a justice of the peace that a notice to abate a nuisance arising in a dwelling-house, which renders such dwelling-house unfit for human habitation, has not been complied with.

If a closing order has been obtained under the Public Health Act in respect to any individual house, and the owner fails to render the house fit for habitation, the Local Authority may demolish it and sell the materials, and, after deducting the expenses, shall hand over the balance, if any, to the owner. The owner may appeal to the Quarter Sessions if he desires to do so. It would appear from this section that no scheme for reconstruction is applicable here, but the land may either be kept as an open space, or sold or let for the erection of dwellings for the working-classes if it is suitable for such a purpose.

It will be seen that Part 1 provides for the taking of a large area, and this area may include business premises and sanitary dwelling-houses, as well as insanitary ones, and it could only be carried out at a very large expenditure of money,—one might almost say, at an enormous cost.

With regard to Part 2, a closing order appears to be an essential feature, and it is very doubtful whether such an order could be obtained merely on the ground that the houses are of the character which have been described as insanitary property. It would have to be shown in addition that they are dilapidated, defective, and *otherwise* dangerous and injurious to health, *e.g.*, liable to fall and crush their occupants.

The other Act under which steps may be taken in Liverpool is the Local Act,—the Liverpool Sanitary Amendment Act (1864–80, &c.),—and hitherto, with the exception of Victoria Square, all dealings with insanitary property have been conducted under this Act, as amended from time to time. Briefly, the requirements of the Act are, that the Medical Officer shall present the property, *i.e.*, report it as insanitary, and the Corporation may purchase it : if the owner declines to sell, or demands too large a price, the amount of compensation is decided by arbitration. These tedious matters being at length disposed of, the property is demolished ; the owner may retain the site if he pleases, or sell it if he pleases, but no buildings can be erected upon it without the consent of the Corporation. The object in working under this Act is to provide suitable accommodation for persons displaced, and to sell the land only for the purpose of erecting such dwellings as are suited to artisans.

Under this Act it would be competent for the Corporation, on a report of the Medical Officer, to practically clear a large area where there are front houses and court houses back to back, but it would not enable them to take any properties which were not reported upon by the Medical Officer as unfit for human habitation. Furthermore, under this Act, the owner may elect to retain the site, and he may thereby prevent the rebuilding of houses on the cleared area. This has only occurred, however, in rare, isolated instances.

The object is, to *rehouse* that section of the community which is at the present time living in dwellings which are inconsistent with health and common decency; in other words, reconstruction must go on step by step with demolition, and the process must necessarily be a gradual one.

It may be stated here, that the death-rate during a series of years, in the various areas now demolished, has ranged from 40 per 1000 to 60 per 1000 (being mainly contributed to by diseases of the respiratory organs and the various zymotic diseases); whereas, in the cottages or blocks erected on the sites, the mortality during a period of the last three years has approximated to 22 per 1000 only.

To recapitulate. Up to the end of 1893, 4126 houses have been demolished, at a total cost of £265,580, or an average cost of £64, 7s. per house. 1062 dwellings have been specially erected on the cleared areas, giving accommodation for 5310 persons, but it may be roughly estimated that the displaced population exceeds those provided for by upwards of 10,000. At the same time, we are confronted with the fact that the total number of houses empty to-day, at not exceeding 6s. 6d. a week rental, is 5442, so it is not to be assumed that the action of the Corporation has resulted in turning people homeless upon the streets. It must also be borne in mind, apart from the enormous cost of the work, that delays in its progress are occasioned in conveyancing, in proving titles, and other legal proceedings, which evidence the law's delay in this as in other matters.

A scheme under the Act of 1890 would involve very great cost, exorbitant demands of owners being in themselves almost enough to damn it. On the other hand, the second section of this Act leaves small corners which are useless for rebuilding, are left waste, and become places of deposit for rubbish and filth.

The Local Act, it would appear, is at present the most available one under which difficulties may be contended against; and an alternative plan, which we may expect shortly to be tried, is indicated on the diagram: should this prove successful in any measure, a very considerable saving will result.

Whether or no the improved dwellings will result in any

equivalent improvement in the habits and tone of the lower
orders is difficult to say, but at least the improvement of the
dwelling will give them a chance of improving themselves,
which under existing circumstances they do *not* possess.

A Word as to the Best Kind of Dwellings.

There is considerable divergence of opinion as to the relative
superiority of blocks three to five storeys in height, with suitable
laundry and other domestic arrangements,—and four-roomed
cottages. The advantage which may be claimed for blocks of
dwellings is that the rental of those on the higher storeys will
be somewhat lower than cottages, and a larger number of persons
can be accommodated in any given area, near to their work. The
disadvantages, however, are, that the blocks tend to overshadow
one another as well as the surrounding dwellings, zymotic
disease spreads more rapidly, and the evils incidental to the
aggregation of large numbers of human beings on a small area
necessarily arise. In almost all blocks of tenement dwellings,
it becomes necessary to employ a caretaker to collect rents and
to supervise the occupants.

Four- or five-roomed cottages facing north-east and south-west,
laid out in proper streets, appear to result most satisfactorily,
and this class of dwelling is the one which, in my opinion, it is
most desirable to erect, as far as circumstances will permit.

Following Dr Hope's paper, Dr STEEVES said:—The cordial
thanks of the Medical Institution are due Dr Hope for his
able and lucid paper, which deals with matters so vital and
important to the welfare of the public. In the sanitary area
of Toxteth Park Local Board District very little property exists
to which the term "congested" could be applied, but I had
once to take action under the "Artisans' Building Act," where
the demolition of the property had to be undertaken. In this
case the following conditions existed, and were sufficient on
which to base my certificate: insufficient ventilation and light;
houses "back-to-back"; dilapidated and defective walls, floors,

and ceilings ; and the absence of all sanitary conveniences. The
defective and broken pavements in connection with such build-
ings are also the receptacles of filthy slops, which percolate in
all directions.

Dr S. G. Moore :—Referring to the objection that the new
dwellings built upon cleared areas do not become inhabited by
the same class of people as those displaced, I pointed out that
such consideration ought not to stay the work, since, in the
first place, if an insanitary property committee concluded its
work, there would remain no insanitary dwellings to be in-
habited, and that thus even the lowest in the social scale would
have to live in better houses. Secondly, if overcrowding must
occur (though that could be minimised by proper action), it is
better that it should occur in houses provided with good ven-
tilation, space, lighting, &c.

I also referred to the stultifying influence of such " rookeries "
upon sanitary measures in general.

GALLANOL IN PSORIASIS. By FRANK H. BARENDT, M.D.
(Lond.), F.R.C.S. (Eng.), *Pathologist to the Royal Southern
Hospital, Honorary Medical Officer to St George's Hospital
for Diseases of the Skin.*

THIS medicament was introduced into dermato-therapeutics by
Drs Cazeneuve and Rollet, who published the first record of its
application in the *Lyon Médical* for April 1893. Gallanol is
obtained by the interaction of aniline and gallic acid. An
abstract of their paper appeared in the Dermatological Peri-
scope of the *Provincial Medical Journal* in the following June,
and in consequence of their statements I decided to try gallanol.
They made use of it in psoriasis and eczema, but my experience
has been confined to the former, for I think we already possess
a sufficient variety of medicaments for the treatment of the
latter. As regards eczema, I may remark that it is not so much
a question of adding to a well-nigh innumerable list of remedies,
as one of determining when and in what form we can apply
them with most benefit and least inconvenience.

Before giving details of my own experience, I shall briefly
allude to the above-mentioned observations of Drs Cazeneuve
and Rollet, and other notices of gallanol that have appeared
during the past year in the *British Journal of Dermatology*, the
American Journal of Skin and Genito-Urinary Diseases, and the
British Medical Journal. I have not seen any mention of the
drug in any of the German or Italian dermatological journals.

1. *The Lyon Médical.*—It was owing to the disadvantages
attending the use of pyrogallic acid and chrysarobin as remedies
for psoriasis that induced Drs Cazeneuve and Rollet to discover
some preparation similar to pyrogallic acid, but unattended with
its dangers. Jarisch introduced pyrogallic acid, or pyrogallol,
as a remedy for psoriasis. Unfortunately for out-patient prac-
tice, its usefulness is curtailed on account of its toxic effects—
gastro-intestinal disturbance, hæmoglobinuria. Where the
patient is constantly under the care of the physician, the use

of Jarisch's ointment can be properly safeguarded. Chrysarobin, in addition to the dermatitis that may follow its too free application, stains linen—a serious drawback not only in out-patient but also in private practice. Gallanol is devoid of these disadvantages. It excites no inflammation, does not stain linen, and has no perceptible odour. The French physicians used it in the form of a dusting powder, with talc, in cases of moist eczema, and as an ointment, varying from 3 to 10 up to 25 per cent., with vaseline, as a vehicle in psoriasis. Gallanol may be thus applied to any part of the integument, including therefore the face and scalp, without any inconvenience.

2. *The British Journal of Dermatology.*—In the section Current Literature of the *British Journal of Dermatology* for August 1893, Dr Marett Tims gives some further details noted by the two French observers. Four grams (about 60 grs.) were given to a dog and ʒss to a man internally without any untoward effect. Moreover, some introduced into the eye of a rabbit caused no conjunctivitis. Chrysophanic acid and pyrogallic acid, even in small doses, as is well known, often cause gastric irritation.

3. *American Journal of Cutaneous and Genito-Urinary Diseases*, March 1894.—Gallanol is described as an active reducing agent, an antiseptic, and a microbicide. It is of great service in moderate psoriasis, but, where this is of the inveterate type, gallanol is not so efficacious as chrysarobin. It is suggested as a remedy for all parasitic diseases where the dermatitis induced by it renders the soil unfit for it to thrive, and thus destroys the vitality of the micro-organism.

4. In the epitome of current literature in the *Brit. Med. Journ.* for December 16, 1893, Dr Bayet's observations in *La Clinique* for September, on gallanol, are briefly stated. Dr Bayet gives the chemical formula of gallanol as an anilide of gallic acid—

$$C_6H_2 \begin{cases} CO.A_2H.C_6H_5(OH)_3 \\ 2H_2O \end{cases}$$

This French observer confirms those of Drs Cazeneuve and Rollet, and extols its remedial action in moderate psoriasis. He

finds it more powerful than β-naphthol; but, in old-standing patches, not so speedy in action as chrysophanic acid.

I shall now mention my own experience of gallanol. I have not used it in any inveterate cases—for the simple reason none have presented themselves for treatment; all my cases were either children or young adults, and in all the psoriasis was moderate. By this, I mean the efflorescences were not crowded together, they were of the guttate type; on the other hand, the eruption was generally universal, *i.e.*, the integument of trunk, extremities, and face, and the scalp were implicated. In none did I notice any untoward symptom whatever, either local or general. As a rule, I have used benzoated lard as the vehicle, for I believe that this, as an ointment basis, is inferior to none, and I order the gallanol to be dissolved in the heated vehicle, not mixed, as the ingredient is better dispersed through it. As regards strength, I have commenced with 2 per cent., increased it up to $12\frac{1}{2}$ per cent., *i.e.*, 60 grains to the ounce of benzoated lard. For patches of psoriasis, liquor gutta-percha, B.P., is a preferable vehicle; the gallanol here is in the proportion of 3j ad. 3j. The chloroform evaporates and leaves a pellicle of gutta-percha containing the medicament in contact with the eruption. This application is best worked into the patch by means of a stencil-brush.

The duration of treatment, reckoning from the time the patients first came under observation to the time when the skin was free from psoriasis, *i.e.*, when the spots were just noticeable as stains, was on the average six weeks. Naturally this depended upon the extent of the eruption, and upon the assiduity of the patient in carrying out his instructions. During this period no internal treatment was used. Therefore neither colchicum nor alkalies, nor potassium iodide, nor arsenic, nor any other drug that is supposed to influence the diathesis of which psoriasis, according to some, is an expression, were prescribed. Local measures alone were taken, and the following method was uniformly ordered to be carried out:—

Green soap was used ointment-fashion at night time; it was well rubbed into the eruption, the hand, if necessary, moistened

with water to facilitate friction. Green soap—sapo viridis (P.G.) —differs from sapo mollis in being made from potash and linseed oil instead of olive oil. It is considered to be a better detergent than sapo mollis (B.P.). In the case of the scalp and face, spiritus saponis alkalini was used.[1] By means of a piece of moistened flannel sprinkled with this lotion the face and scalp were well rubbed for five minutes. The patients were ordered to time themselves, then the parts were thoroughly douched with hot water, and dry-rubbed. In cases where the scales in the scalp were thick, liquor potassæ was painted on during their visit to me, and the green soap applied over night. The following day a hot bath was taken, and after two or three nights of the green soap treatment and warm baths, the efflorescences were fairly free from scales. The ointment was then rubbed within at night time, and every fourth night a hot bath was taken. If the patient complained of discomfort of the greasy application—a discomfort which was rarely noted—a dusting powder of equal parts of Venetian talc, oxide, and zinc and starch was thoroughly dredged over the surface and in the folds of the linen. As improvement appeared the hot bath and green soap were used once a week, but the gallanol was increased. When the eruption had faded, the gallanol ointment was stopped, and salicylic acid, 2 per cent., or β-naphthol, 2 per cent. in benzoated lard, was ordered to be rubbed into the skin thrice a week for their antiseptic and anti-parasitic action.

Arsenic was now prescribed for its alterative action, and the patient kept under treatment for some time; unfortunately, in spite of one's wish, oft repeated and urged, they soon ceased attendance, for being free from their disease they preferred to be free from it mentally. Another example of out of sight out of mind.

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[1] Hebra's formula is ℞ saponis viridis, 100 grms.; solve leni calore in spiritus vini, 200 grms. Filtra et adde olei lavandulæ, olei bergamiæ, aa 3 grms. M/S. Lotio.

ON SOME RARE CASES OF ACUTE INTESTINAL OB-STRUCTION.[1] By GEORGE G. HAMILTON, M.B., F.R.C S. Edin.

MR PRESIDENT AND GENTLEMEN,—In selecting eleven cases of acute intestinal obstruction to bring before the notice of your Society this evening, I have been guided not so much by the present-day custom of reporting successful cases only, but have tried to make each case illustrate some point either of practical diagnostic value or of developmental interest.   Given, an apparently healthy patient, who *suddenly* develops symptoms of acute intestinal obstruction, such as we see in a strangulated hernia, but in whom no hernia can be found, we are, as a rule, justified in supposing that the cause of such patient's obstruction is, in all probability, a band, a hole in the mesentery, the vermiform appendix, Meckel's diverticulum, or some such cause, and is not dependent on malignant disease, especially if the patient be under thirty-six years of age.

Now, CASES 1 and 2 were singular exceptions to this rule, for both were malignant, and yet the onset of the attack was sudden, and the symptoms those of acute intestinal obstruction.

In the first, a man aged 40, I explored the abdomen, but the distension of both large and small bowel was so great that it was impossible to make an exact diagnosis; and although we concluded that an obstruction existed in the sigmoid flexure, still, so hidden was a small annular stricture in this situation, that the hand, passed along the distended sigmoid flexure, failed to find any cause of obstruction, and even at the post-mortem examination considerable difficulty was experienced in detecting a small ring, which, on microscopic examination, proved to be a cylindroma, the existence of which had evidently caused no symptoms until a piece of rabbit-bone covered with calcareous salts had suddenly become impacted in its lumen.

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[1] Read before the St Helens Medical Society.

The second patient was a woman aged 39, who had similar
acute symptoms.   On opening her abdomen I found a *band*
extending from the sigmoid flexure across to the right, where,
becoming attached to the mesentery, it constricted a loop of
small intestine.   This band was apparently the cause of the
obstruction, except that the portion of bowel beyond the
constriction was not so diminished in size as is usually the
case.

The band was divided, but the woman died unrelieved; and
at the autopsy a similar condition to the foregoing case was
found, with the exception that, instead of a rabbit-bone, a
cherry-stone was tightly impacted in an annular stricture
situated between the sigmoid flexure and rectum.   From this
stricture a fairly firm band of organised lymph had extended
across the abdomen and constricted a loop of small intestine, so
that in reality there was a double obstruction, which helped to
account for the enormous distension.   The real cause of the
suddenness of the symptoms was the impaction of the cherry-
stone; and had the woman come into hospital sooner, before
such great distension occurred, there would have been much less
difficulty in putting one's finger on the real cause.

A second very good general rule is, that when a patient is
over forty, is losing flesh, and has some cachexia, malignant
disease in some form will, in all likelihood, be the cause.

CASE 3 forms an exception to this rule.   He was a farmer,
aged 47, whom I saw with Dr Barr, and who, twelve days before,
while apparently in good health, was seized with sudden pain in
the abdomen, and vomiting.   He certainly looked like a man
suffering from malignant disease, being sallow, somewhat jaun-
diced and emaciated.   Taking into consideration the suddenness
of the onset of the symptoms, I determined to explore his abdo-
men, and was well pleased that I did so, for I easily separated
an appendix epiploica of the sigmoid flexure, which was found
attached to an inflamed mesenteric gland, forming a loop
through which two coils of small intestine were constricted.

This patient made an excellent recovery.

Cases 4 and 5 were fully reported in the *Lancet*, vol. ii., 1888,

p. 665, but as I have the specimens and drawings to show you, perhaps you will pardon me if I read you an extract from that report.

CASE 4.—On the first Sunday of May 1877, Dr Barr asked me to see, with a view to some surgical interference, a boy aged 6 years, who had been that morning admitted to the Liverpool Northern Hospital suffering from symptoms of very acute intestinal obstruction. The boy had been put to bed the previous evening (that is to say, Saturday evening) apparently in his usual health. He had had no motion for four days, although on more than one occasion he had felt inclined to have the bowels moved. At three o'clock on Sunday morning he woke up, complained of severe pain in the lower part of the abdomen, was very ill, and vomited pretty continuously until his father brought him to the hospital at noon. When admitted, Dr Thompson, the house physician, described his condition as one of severe collapse, the expression being anxious, the lips livid, and the pupils dilated. The patient was restless, vomited frequently, lay on his left side with his knees drawn up, and complained of great pain in the lower part of the abdomen. Enemata, atropine, and other remedies were tried, but by four o'clock on the same Sunday afternoon the vomited matter had become stercoraceous, and he was much worse.

Late in the afternoon I saw him with Dr Barr. His condition then was one of grave collapse, the tongue being dry, the pulse very weak and rapid, the expression anxious, the temperature 98·4°, and the patient still very restless. On examination, the abdomen was found to be apparently normal, with the exception that on deep palpation an ill-defined hardness was discovered in the lower part of the umbilical region. No distended portion of intestine could be made out, even with the aid of an anæsthetic. The case was diagnosed as one of acute intestinal obstruction, and I decided to operate the same evening. His state was now much more serious; the pulse was imperceptible at the wrist, the hands were blue, and the skin was covered with a cold perspiration, the patient lying in a semiconscious condition. So ill was he that one of the surgeons

present remarked that there was great risk of his dying on the operation table.

Operation.—At nine o'clock, or eighteen hours after the first appearance of acute symptoms, a small quantity of ether was administered. An incision 4 inches in length was made in the middle line extending downwards from immediately below the umbilicus; only one small vessel had to be tied. On opening the peritoneum, it was at once noticed that one knuckle of bowel was deeply congested, as compared with the others which presented. It was soon evident that this dark-coloured bowel ran downwards into the pelvis, and was constricted by a band which crossed more or less transversely. I first explored the caput cæcum coli and vermiform appendix, but these were found to be normal. The ileum was now traced from the ileo-cæcal valve, and very soon the constriction was come upon. The transverse band above mentioned was found to be Meckel's diverticulum, which was about 3 inches in length, and had become attached to the mesentery behind, close to the spine. The diverticulum sprang from the ileum, 2 feet from the ileo-cæcal valve. A loop of about 2 feet of small intestine was firmly constricted by the diverticulum. The dark, distended portion beyond the constriction occupied the pelvis, and had to be emptied of gas before it could be withdrawn from between the bladder and rectum, thus accounting for our inability to discover it before the abdomen was opened. The attachment of the extremity of the diverticulum was ligatured with catgut in two places and divided, and the constriction was easily relieved. The diverticulum itself was not removed. The patient made an uninterrupted recovery.

CASE 5.—A boy of the same age, and very much like the previous patient, also came under Dr Barr's care with a somewhat indefinite history of intestinal obstruction. Similarly, on a Saturday night he was put to bed apparently in his usual health, but on Sunday morning complained of griping pain in the abdomen, and passed a small motion. He vomited continuously, it seems, until he was admitted to hospital on the

following Wednesday. The day before admission the mother had given him an enema, which had resulted in a small motion.

When admitted, on the fourth day of his illness, Dr Haswell, the house physician, unfortunately found it very difficult to obtain a definite history as to the state of the boy's bowels previously. The following is Dr Haswell's note of the patient's condition shortly after admission :—"Complains of pain over the abdomen, which is greatly distended and tympanitic. The tongue is coated with a thick brown fur behind, but clean and moist in front. Has vomited twice since admission, the vomited matters being copious, and consisting of curdled milk and altered bile ; no fæcal odour. Distension of abdomen so great that little can be discovered on palpation." Three coils of intestine could be made out running transversely.

Mr Puzey saw the boy with Dr Barr on Thursday, but they did not then consider it advisable to operate. The patient remained in much the same condition, vomiting four times on Thursday and twice on Friday. Late on Friday night Dr Barr saw him, and he then seemed a little better. On Saturday morning, however (the seventh day of his illness), Dr Barr found him very much worse, and sent for Mr Puzey with a view of operating at once. The boy was then practically moribund. Mr Puzey was unable to go, and in his stead I opened the abdomen about midday. An incision was made 4 inches in length midway between the umbilicus and pubes. What looked like a loop of small dark intestine was found to be adherent to the anterior abdominal wall a little to the left of the centre of the incision. This protruded between, and was adherent by recent lymph to, two transverse coils of healthy small intestine. The adhesion to the anterior abdominal wall was divided, and, after breaking down the adhesions by lymph, the portion of dark bowel was returned. I was not satisfied that the constriction was completely relieved, as I felt something at the neck of the discoloured portion of bowel. I was proceeding to investigate this, when my attention was called to the boy's condition. He was pulseless, and it was thought advisable to get him into bed at once, trusting that this partial operation might relieve

the constriction. This, however, was not the case, and the boy died in six hours.

After death the portion of bowel which had been adherent to the anterior abdominal wall was found to be really the club-shaped and dilated extremity of Meckel's diverticulum, round the neck of which $2\frac{1}{2}$ feet of ileum had become twisted. The diverticulum was found to spring from the ileum 3 feet from the ileo-cæcal valve. Of this 3 feet, $2\frac{1}{2}$ feet became twisted twice round the neck of the diverticulum. The bowel was constricted by the diverticulum, and the neck of the diverticulum was constricted by the two turns of bowel which encircled it.

Case 6 is perhaps the most interesting of the series, because of its rarity.

CASE 6.—A girl, æt. 15, whose abdomen has been noticed to be swelling for four months, but who otherwise appears to be in good health, takes ill somewhat suddenly on a *Thursday* night.

Her symptoms briefly are *vomiting, pain in the right iliac region, constipation,* and general distress. She is better on Friday, ill again on Saturday, vomits some bilious but not distinctly fæcal matter on Sunday.

In this condition, with occasional attacks of vomiting, she continues for *eight* days—one day better, the next day worse, until Dr Nisbet, her medical man, asks me to see her on the following Sunday morning, owing to her symptoms, especially the localised pain, having become much more acute. On inquiry, I find that her bowels have not been moved for ten days, *i.e.,* during the present illness, but she is able to pass some wind by the rectum.

She has a quick pulse, a very anxious expression, and while we are in the room she has an attack of violent pain, which causes her to get on to her hands and knees, or to move about the bed with her arms firmly clasped over the abdomen.

The abdomen is much swollen, and one can make out well marked vermiform movements in distended portions of intestine, especially in the right iliac region. Beyond this nothing is discovered, and her removal to hospital for further treatment

is recommended. Here, then, is a case of acute intestinal obstruction supervening on a subacute attack, with very little to guide one as to the nature of the obstruction.

It was evident that if the girl was left alone she would, in all probability, die, as her hands were getting cold, her features pinched, and her expression very anxious.

The pulse, however, remained moderately good.

Now came the question, should an exploratory incision be made in such a case, and in deciding this, one took into account—

1st. Her *age*, and here we were able to exclude cancerous and most likely syphilitic stricture.
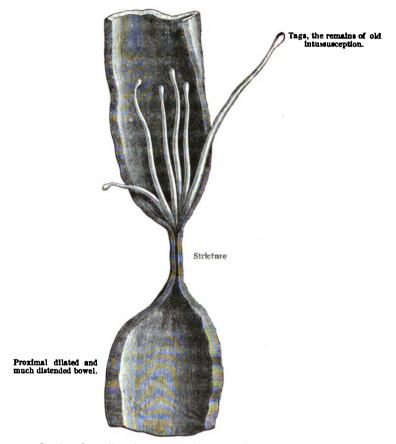
2ndly. We took into account the suddenness of the onset of the actual symptoms. And,

3rdly. The absence of any symptoms of peritonitis or any rise in temperature. The great barrier to a successful exploration was evidently the marked distension.

I explored the abdomen, hoping to find some cause of obstruction *outside* rather than *in*, the lumen of the bowel.

The ordinary incision between the umbilicus and pubis was made, and my first intention was to explore the caput cæcum and vermiform appendix, and then, if possible, to trace the small intestine from the ileo-cæcal valve. You can understand my being much disappointed at not being able to find either caput cæcum, vermiform appendix, or ileo-cæcal valve, for the sufficient reason, as was afterwards proved, that none of these structures existed. I then tried to follow various coils of much distended small intestine, and explored the rest of the abdomen. I was able to make out a thickened portion of omentum in the region of the hepatic flexure of the colon, but this could not be brought into view, and it now seemed undesirable to prolong the operation. One of two procedures remained, either to close the wound or to make an artificial anus as rapidly as possible. The latter measure was adopted. An incision 1 inch in length was made into the small intestine, and two large basins, full of liquid fæces, were removed. The intestine being clamped by the fingers of an assistant on each side of the incision, one of Senn's bone-

plates was introduced through the wound in the bowel, the four threads being brought from within outwards in the usual way.

An opening now existed into the bowel, through the centre of the bone-plate, and this I closed temporarily with a continuous suture, so that little or no fæces could escape. The bone-plate

Tags, the remains of old intussusception.

Stricture

Proximal dilated and much distended bowel.

Structure of ascending colon, the result of intussusception many years previously.

was now brought to the lower part of the abdominal wound and fixed there, peritoneal surface being in contact with peritoneal surface. The rest of the abdominal wound having been closed, the patient was put back to bed.

The following day the finger was gently introduced through the centre of the bone-plate, and a considerable quantity of liquid

fæces escaped, none getting into the peritoneal cavity, owing to the adhesion of the bone-plate.

I now hoped that possibly the patient might have a chance, as she seemed fairly well, but she died somewhat suddenly the following night. (Mr Paul's glass tube is a more recent improvement on the bone plate.)

Here is the specimen which was obtained post-mortem (fig.) You will observe an extremely narrow constricted portion of the ascending colon, which was situated immediately below the hepatic flexure, and around the outside of which a piece of omentum was firmly adhering.

The wall of the colon on the proximal side was very much hypertrophied, and in the recent state was much distended. A large number of tags, some of them 5 inches long, filled the intestine on each side of the narrow stricture; the caput cæcum, vermiform appendix, and ascending colon were absent.*

This specimen at the time was sent to Mr Treves, and here is a letter he very kindly wrote me :—

"Dear Mr Hamilton,—The specimen is extremely interesting and is of the utmost value.

"No congenital condition of any kind will explain the disposition of parts as found after death. The colon and the small intestine may meet at the site of the hepatic flexure, and there may be no ascending colon, but in no instance will the cæcum and appendix be absent.

"The stricture is, without doubt, the result of an intussusception (as you suggest).

"There must have been an intussusception of that specific kind known as the 'ileo-cæcal' (not the 'ileo-colic').

"The intussusception must have become gangrenous, and have been passed per anum. The part eliminated by gangrene may measure several feet. In one specimen quoted in my book (p. 197), the cæcum and the whole of the ascending colon were passed on the eleventh day in a state of anatomical perfection. The gangrene in these cases is very apt to be of unequal

* One of these tags had become doubled on itself, and filled the stricture, thus accounting for the *acute* symptoms.

degree. As a rule, the middle of the returning layer suffers the most. On the other hand, the internal or entering layer may be the more completely destroyed.

"In your case it is probable that the more complete destruction concerned the returning layer. The long strange-looking tags are very characteristic, and represent those shreds and fragments of the intussusception which have survived. In this case they probably represent the shreds of the entering layer. These tags are commonly met with after destructive processes within the bowel, and they can be seen often well-marked in cases of cicatrisation after dysenteric ulceration. The presence of these tags make the nature of the case clear. The formation of stricture, after the separation of an intussusception, is *very rare*. I figure one such case in my book (p. 250). In that book you will find an account of such cases as I have been able to collect. The extreme rarity of this sequela makes your case one of the first importance.—Yours sincerely,

"FREDERICK TREVES."

CASE 7 is a typical case of obstruction, due to a *band*. A carter, aged 40, was backing his cart, four days before admission, when he was seized with a violent pain in the abdomen, which felt like severe colic. He had to leave his work and went to a dispensary, where he was given some opening medicine. He then returned home and was violently sick, continued to vomit, at first brown and afterwards bilious matter, but not on any occasion anything that could be described as fæcal. The doctor in attendance very wisely concluded he ought to be operated on at once, and I opened his abdomen on the morning of the fifth day, to find a loop of small intestine 18 inches in length, dark port-wine in colour, and so tightly constricted by a band, apparently resulting from a hole in the mesentery, that a slight ulcerative process was commencing. The band was divided, the bowel relieved, and I see that the dresser reports that the whole operation took twenty-four minutes.

A case which should have been equally successful, had the man been sent into hospital as soon, is No. 8 in the list. He was 22 years of age, and came under my care a few weeks ago,

with the following history:—Ten days before, he was going to
his work in the early morning, and felt a sudden pain in his left
hypochondriac region. He had to go home, and at midday,
after taking some tincture of rhubarb, he vomited what he
describes as "nasty brown stuff" with an offensive smell. The
doctor saw him, but did not evidently recognise anything of
very grave importance, for he kept him for ten days, during six
of which he was vomiting fæcal matter. When he came into
hospital he was not in a very good state, and I said, before
operating, if I did not find a band or something which could be
easily remedied, I should simply content myself with an explora-
tory examination, and not proceed further. He was so certain
about the seat of the pain, and there did seem two prominent
coils of bowel in the left hypochondriac region, that the incision
was made contrary to custom in the left linea semilunaris.
Nothing that could be quickly remedied could be felt, and the
caput cæcum and vermiform appendix were healthy, but through
the distended bowel a feeling of resistance could be made out
near the lower end of the ileum. The patient was very ill, as
you may imagine, after six days' fæcal vomiting, so I did not go
further with the operation, and he died the following day.

Post-mortem.—Three inches from the ileo-cæcal valve was
found about 2 feet of very narrow ileum, so twisted and so
adhering with recent lymph to other collapsed coils in its
neighbourhood, that at first it was difficult to make out what
had happened. The whole was localised into a kind of knot,
but in the centre, by opening the bowel and passing a probe
from its interior, we were able to demonstrate a Meckel's
diverticulum very much like case 5.

I feel quite certain that this case would have been saved had
he been sent in a week before.

It is instructive to note how little is to be relied on the seat
of the pain, for here, the left hypochondrium was the region
where the patient was quite decided about both the initial and
the subsequent pain, whereas the right iliac was the region
where the actual obstruction existed.

The three cases of atresia of the rectum I propose to include

in my list have come under my care during the past
two years, and as the arrest of development was different in
each case, they present several points of interest. I will take
the liberty of reminding you of the normal development of the
anus and lower part of the rectum, and then point out in what
respect these cases were abnormal.

Let us look now at the cases under consideration. All three
were boys, and the external genitals in all were well developed.
The first was brought to me by Dr Bushby twenty-four
hours after birth. There was not the slightest attempt at the
formation of an anus, and the median raphé in the perineum
was absent. However, on pressing the finger well up into the
hollow of the sacrum an indistinct impulse was felt, when the
child cried, and an incision was made, extending from a little in
front of where the anus ought to have been, backwards on to
the dorsal surface of the last piece of the sacrum. The coccyx,
which was found much curved inwards, was exposed and re-
moved, and the hind gut was found at the upper part of the
hollow of the sacrum. By means of a needle in a fixed handle,
with a very large curve, two sutures of silk were passed through
the skin and well through the hind gut, which, after being freed,
could be considerably drawn down. The gut was opened, the
sutures were drawn from within and divided, and thus four
points of contact between bowel and skin were made.

The second case Dr Harris asked me to see two days after
birth. Here a depression existed, which admitted the little
finger as far as the first joint; but it was thought wiser to
approach the gut, as in the other case. The hind gut was found
passing behind what corresponded to the proctodæum, and was
treated as in case 1. The anus was of such a rudimentary
character that no use could be made of it.

The third case I was called to by a medical man in Rockferry,
three days after the birth of the child. The nurse on the second
day had called the attention of the doctor to the fact that there
was no meconium on the napkin, but on examining the napkin
the doctor discovered some meconium, which, however, the
morning after was proved to have come from the penis—there

being no trace of an anus. On examination, I found a little meconium coming from the urethra, but the child at that moment passed some urine, which was perfectly clear, showing that the communication was most likely anterior to the bladder.

I found also on examining the umbilicus that fæces was exuding from IT. There was an irregularly-developed raphé in the perineum, but no trace of an anus. The same treatment was adopted as in the other cases.

The result of these operations has been as follows:—The first child made an excellent recovery, and, when last seen, had control over its motions like any other child. The second case, Dr Harris tells me, lived eight months, and was in a satisfactory condition, but died of whooping-cough. The third case, operated on, eight months ago, has been successful as far as the rectum is concerned, the child having made a good recovery, and the patent vitelline duct having closed. There is still a small quantity of fæces passed by the urethra, but at times the urine is quite clear. (Some general remarks on intestinal obstruction were then made, and a discussion followed.)

Analysis of Eleven Cases of Acute Intestinal Obstruction under the care of Mr George G. Hamilton.

Case.	Sex.	Age.	Nature of Obstruction.	Operation.	Result.
1.	M.	40.	Cylindroma of sigmoid flexure. Impaction of rabbit bone.	Abdominal Section.	Distension so great that abdomen could not be satisfactorily explored.
2.	F.	39.	Annular constriction in sigmoid—Cherry Stone — Fibrous band.	,, ,,	Band found and divided. Symptoms unrelieved.
3.	M.	47.	Appendix Epiploica adhering to inflamed mesenteric gland.	,, ,,	Band divided. Recovery.
4.	M.	6.	Meckel's Diverticulum constricting a loop of small intestine.	,, ,,	Constriction freed. Recovery.
5.	M.	6.	Meckel's Diverticulum, round the neck of which 2½ feet of ileum had become twisted.	,, ,,	Child too ill to complete operation. Stricture only partially relieved.
6.	F.	15.	Stricture at Hepatic flexure of colon, due to old intussusception.	,, ,, Artificial anus.	Obstruction relieved, but died following day.
7.	M.	40.	Fibrous band.	Abdominal Section.	Recovery.
8.	M.	22.	3 feet of ileum twisted into knot around Meckel's Diverticulum.	Abdominal Section after week of fæcal vomiting.	Died unrelieved.

Three Cases of Obstruction due to Atresia of the Rectum.

Case.	Sex.	Age.		Result.
9.	M.	24 hours.	Removal of Coccyx. Gut stitched to skin.	Recovery.
10.	M.	2 days.	,, ,,	,,
11.	M.	3 days.	,, ,,	,,

Reviews.

Both these works may be taken as safe guides to practice in
the treatment of diseases of the nose and throat. Neither
is open to the charge of any marked originality of method
or of theory, but both are certainly well adapted to serve
the purpose for which they are written. After all, since
the appearance of Bosworth's great book, there is very little
room, at present at least, for any new and complete treatises
on the subject, and that is, of course, not aimed at in books of
moderate size, such as these. Dr Ball's book has attained a
second edition, and has, therefore, presumably met a want. It
contains a most excellent account of the anatomy of the nose, and
also of the most recent researches on the physiology and physics
of nasal respiration. The relation of the nasal cavities to the
resonance of the voice is well and clearly given. A chapter
on the general semeiology of nose disease will be found
very useful. Nothing new is suggested for the treatment of
hypertrophic or atrophic rhinitis, but the ordinary methods
are well described. The chapter on naso-pharyngeal disease
is fuller than is usual in books of this kind, and the author
adopts, with some reservation, Tornwald's views on the

importance of the bursa pharyngea as the exciting cause of trouble in the naso-pharynx. Among other useful portions of the book may be mentioned the chapter on reflex nasal neuroses, which states the case fairly and accurately. The section on the pharynx has been added in this edition, and it is quite equal in merit to the rest of the work. On the whole, the book is well and clearly written, and is marked throughout by a distinctly practical tone.

Dr Hall's work is one of the "Practical Series" published by Mr H. K. Lewis. Professing, as it does, to give something like a complete account of the whole subject of throat and nose disease in the space of 500 small pages, it is necessarily very brief on individual subjects. There is no account of anatomy or physiology, which, especially as regards the nose, seems a distinct defect. Nasal anatomy and physiology is by no means fully described in anatomical works, but is very important for a thorough comprehension of disease in this region. Ætiology, too, is but sparingly treated. This does not apply to the chapter on ozæna, where a very complete account of causation and pathology is given. The treatment is thoroughly practical, and is evidently based on personal experience to a large extent. For polypi of the nose, Dr Hall prefers and recommends the galvano-caustic snare, to our minds an unnecessarily complicated instrument. As regards nasal disease generally, all the well-tried remedies are fully given. The section devoted to laryngeal diseases is the best in the book. It is well up to date, and contains numerous references to contemporary literature. In particular, we would mention the section on nervous affections as clear, and, so far as possible, sufficient. On the whole, the book is worthy of its author and of the series of which it forms a part; but it may be seriously questioned whether the multi-plication of short books on long subjects is, on the whole, useful or desirable. If it be, then this work and that of Dr Ball are good specimens of their class.

DWELLING-HOUSES: THEIR CONSTRUCTION AND ARRANGEMENT. By W. H. CORFIELD, M.A., M.D. (*London : H. K. Lewis.*)

THIS little volume has reached a third edition, a fact which suggests that the little book has evidently supplied a want.

The sanitary matters relating to dwelling-houses are treated in a careful and practical manner, and the chapters devoted to the situation and construction of houses; their ventilation, lighting, and warming; the water-supply; removal of refuse, also sewerage, and the removal of waste water, &c., are carefully written.

The work is founded on a course of lectures delivered before the Society of Arts, and is evidently intended for popular instruction. At the same time, it well deserves a careful perusal by those who desire to read a brief sketch of the sanitary requirements of dwellings.

The book has numerous illustrations showing means of ventilation, warming, filtration of water, &c.

THE DISEASES OF CHILDHOOD (MEDICAL). By F. BRYAN DONKIN, M.D. OXON., F.R.C.P., *Physician to the Westminster Hospital, and to the East London Hospital for Children at Shadwell.* (*London : Chas. Griffin & Co., Exeter Street, Strand.* 1893.)

NOTWITHSTANDING the considerable number of works that have been published of late years on the subject of diseases of children, we certainly think no apology was needed for the appearance of this volume. It is based to a great extent, according to the author's statement, on the records and recollections of nearly twenty years' service at the East London Hospital for Children. Throughout its pages it is everywhere apparent that the author writes from careful observation and

large experience. The work is not one which once more travels over the well-trodden path of the narration of well-recognised clinical facts, but rather assumes a general knowledge on the part of the reader of the diseases discussed, and dwells on points on which there is still room for discussion, and on which fresh evidence is of value.

As, uniform with this volume, there is in preparation another on the Surgical Diseases of Children, by Bilton Pollard, F.R.C.S., this work does not wander beyond the domain of the physician, nor does it enter at length into discussion of the pathological anatomy or bacteriology of disease, but leaves these matters to books on these subjects. We have, then, in a readily-handled volume, an eminently practical work on the diseases of children, which will be useful both to the student and the experienced practitioner.

AN AMERICAN TEXT-BOOK OF THE DISEASES OF CHILDREN. By AMERICAN TEACHERS. Edited by LOUIS STARR, M.D. (*Published by W. B. Saunders, Philadelphia, and F. J. Redman,* 11 *Adam Street, Strand, London.*)

THIS is a work of unequal merit. It possesses many excellences and not a few faults. At the first glance one is impressed with the numerous very beautiful illustrations, coloured, and in black and white, with which the volume is adorned. The electrotypes from photographs are especially works of art. Not a few of them, however, seem somewhat superfluous. There is, *e.g.*, a coloured plate representing the organs from a case of hæmorrhage in the new-born, which is hardly of sufficient interest to deserve a place in a text-book that aims at being condensed. Another plate representing the scarlatinal rash will hardly convey much information either to those who have never seen it in the living subject, or to those who have. In the article on phimosis there are photographic illustrations

of the organ both before and after circumcision, which are of no importance, nor do we think the urinary deposits well represented. On the other hand, many of the coloured illustrations of skin diseases are good. There is a very good photograph showing the positions of the operator and the patient in performing the operation of intubation of the larynx, which conveys more information than a page of print.

As regards the letterpress, it consists of a series of articles contributed by over sixty different authors, all of them American, and, naturally, they are not all of equal merit.

In the preface the editor states that his object in preparing this work has been to present to the profession " a working text-book, which shall be closely limited to, while completely covering, the field of pediatrics." It seems to us that he has hardly succeeded in either of these aims. We find an extensive article on syringomyelia, a disease of the spinal cord, described by Charcot, Bruhl, and others, as commencing between the ages of 15 and 25 years; and the writer of the article admits that in the only case he has seen, symptoms commenced at the age of 25 years. How, then, does it find a place in a book which is closely limited to diseases of children ? On the other hand, no medical man can practise much amongst children, far less be attached to a dispensary or hospital for children, without frequently seeing and treating cases of meningocele, spinal or cerebral; and yet this common malformation is nowhere mentioned in this work, which professes to completely cover the field of pediatrics. Again, there is a long article on calculus of the bladder and its operative treatment, a subject that seems more suited for discussion in a text-book of surgery; and yet there is no information as to a disease particularly common amongst children, which it is of the utmost importance the general practitioner should recognise early, and be able to treat skilfully,—that is, Pott's Disease, or caries of the spine.

In further recommendation of this volume, the editor says that, in order to make it useful to the practitioner, "who must too often read as he runs," he has been careful to condense

his matter, "so that the whole subject may be embraced between the covers of one readily-handled volume"; yet the volume before us is of no mean dimensions, weighing close on 7 lb. avoird.,—rather a weighty work with which to emburden the afore-mentioned nimble practitioner.

We have dwelt on the faults of this work the longer because we recognise its undoubted merits. We have read with pleasure and instruction the editor's able article on the general management of children; and other articles, contributed by well-known writers, such as J. Lewis Smith, Da Costa, and others, are also worthy of notice. We think the intentional omission of reference to authorities by many of the writers will seriously diminish the value of this work as a book of reference. Such references in marginal notes, or in an appendix, might have been added without materially increasing the bulk of the book. Even when authorities are cited, they are not sufficiently carefully named as to be recognisable. Virchow, Henoch, and West we know, but who are Smith, Jones, and Robinson?

INTRODUCTION TO THE CATALOGUE OF THE COLLECTION OF CALCULI OF THE BLADDER. By Sir HENRY THOMPSON, M.B., F.R.C.S. Lond. (*London: J. & A. Churchill.* 1893.)

THIS little book—39 pages—is an introduction, not to the already well-known collection of urinary calculi in the Hunterian Museum, but to a splendid private collection recently presented by Sir Henry Thompson to the Royal College of Surgeons. It includes all the stones and foreign bodies removed in 1013 operations by this renowned specialist during the whole of his surgical career. With the specimens Sir Henry presented a descriptive catalogue giving short details of every case, copies of which are to be found in the museum. A catalogue, however, though it may explain fully each case, does not teach the valuable practical lessons which they conveyed to the surgeon.

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Hence the scope for this introduction, which is really a very short résumé of the vast amount of practical work done, and the conclusions arrived at by the author.

The introduction opens with an explanation of the arrangement adopted in the catalogue; then follows a short sketch of the part taken by the author in perfecting the two great operations of lithotrity and lithotomy, and finally various analyses and tables are given, all of which are full of interest. In reference to lithotrity, Sir Henry does not emphasise those periods in which this operation passed through such changes as to mark definite eras in its history. He declines to recognise the name litholapaxy, and passes without comment its introduction as a mode of treating stone in children. No doubt, as a narrative of personal experience, this is reasonable. A surgeon having such a continuous practice in the use of the lithotrite passes with gradual and easy transition from old to new methods, hardly recognising the leaps that have been made; but the profession generally have thought Bigelow's operation well deserves a special name, and have adopted and will retain it. They are likely also to associate the name of Surgeon-Major Keegan for a long time to come with the practice of lithotrity in children. However, as has been said, the introduction is a narrative of an extended personal experience, and an analysis of the finest private collection of the kind ever amassed in this country, and, as such, it has an especial value. In his preface the author says:—" I have endeavoured to make it absolutely faithful in regard of all the facts which have come under my observation in connection with my personal experience in operating for stone in the bladder." We can thoroughly endorse this statement. The book throughout is a plain story of facts. Sir Henry has personally nothing to gain or to lose in the publication of his statistics, and statistics are not the less valuable and reliable on this account. Short though it be, this introduction deals with too wide an experience to be passed over by any one who desires to be *au fait* in the literature of the subject of which it treats.

LECTURES ON THE SURGICAL DISORDERS OF THE URINARY
    ORGANS.   By REGINALD HARRISON, F.R.C.S.   (*Fourth
    Edition.   London: J. & A. Churchill.   1893.*)

WE have noticed previous editions of this popular monograph,
and are pleased to again offer our congratulations to Mr Harrison
on the continued and deserved appreciation of his work. The
present volume is not much larger than the last, but it is in part
re-written, and so room has been found for a good deal of new
matter without corresponding increase in bulk. The illustrations
are good, and more numerous than ever, there being now no less
than 156, most of them occupying half a page. The index, also,
has been considerably augmented, and is as full as could be
desired. The general character and plan of the book remains
the same. Written in Mr Harrison's pleasant and easy style, it
presents nothing of the text-book, but is a faithful reflection of
the ever-increasing experience gained in his extensive special
practice. The book is one which is particularly useful to the
general practitioner, as he will readily find in it just the sort of
help and advice he is likely to want in the treatment of his
urinary cases.

TREPHINING IN ITS ANCIENT AND MODERN ASPECT.   By JOHN
    FLETCHER HORNE.   (*London: John Bale & Sons.   1894.*)

THIS is a small book, of somewhat over 130 pages, largely
devoted to quotations from authors—ancient, mediæval, and
modern. The gist of the work would appear to be the relation
of four cases of fractured skull, in which trephining was success-
fully practised. Of these, one was treated by the author in
private practice, two by his present hospital colleagues, and one
by Mr Wheelhouse in the Leeds Infirmary during the house-
surgeoncy of the writer. In publishing these cases, it has
evidently occurred to the author to supplement them with an

account of the literature of the trephine, both old and new. The cases are related in somewhat fragmentary fashion, and present no features of special interest.

In two of them the formation of what he calls "healthy pus" appears to have been abundant; a third was admitted with a sinus, suppurated afterwards, and after about a fortnight was said to be "comparatively well"; while in the fourth not a word is said about the progress of the wound, except that after three and a half months it was "practically healed," and the patient discharged.

The only dressings mentioned are carbolic oil on lint in one case, and "water dressing" in another; but uninteresting as the treatment seems to have been from an artistic point of view, it is satisfactory to know that recovery took place, and in one instance was maintained after ten years.

The work is chatty and quite readable, but entirely superficial, and somewhat diffuse. It collects together a good many references, and gives a fair idea of what has been done in the past in the way of opening the living skull, not merely by trephining, sawing, and chiselling with metal instruments, but also by the bone-scraping perforations supposed by Broca and others to have been effected by barbarous nations with pieces of flint and broken glass. The various injuries and diseases for which trephining has been proposed and done are duly mentioned in order; and not merely are the various instruments used at various times referred to and depicted, but some discussion of the symptoms is attempted. The final chapter, entitled "Remarks on Trephining," draws a contrast between the old-fashioned somewhat exceptional operations before the antiseptic era, and those so much more frequently now undertaken with much added success, while the author makes free mention of many details of procedure incidental to these improved operations.

The illustrations are of mixed qualities, but some are excellent, and represent many old as well as recent instruments.

As a collection of references it is saved from being valueless, but it is too carelessly put together to be of any systematic value.

COMMON NEUROSES. By J. F. GOODHART, M.D., F.R.C.P.,
Physician to Guy's Hospital. (*London : H. K. Lewis.*)

THIS is the title given to the subject-matter of three lectures
delivered by Dr Goodhart before the Harveian Society in 1891.
He divides the common neuroses into those that are—I. Central;
II. Cardiac and respiratory; III. Abdominal. As types of the
neurotic conditions affecting cerebral action—the central neuroses
—the author cites the dread that certain individuals have of
going into society or crowded places, Menière's disease, sleepless-
ness, headaches, spinal and other vague affections,—vague enough
possibly to the physician, but real indeed to the sufferer. Dr
Goodhart admits at the threshold the difficulty in treating
these varied affections, but his remarks are weighty in insisting
upon the tact of the physician, the nature of the advice, and
the use of drugs in quite a subordinate manner.

As regards the thoracic neuroses, Dr Goodhart elevates into
prominence the importance of treating the patient and not the
disease, and recognising the neurotic element; he conveys a warn-
ing as to the danger of specialising the neurosis down to some local
affection, often of no consequence in the ætiology of the com-
plaint, instead of taking a wider view and treating the patient
as a neurotic. Catching cold, spasmodic asthma, angina pectoris,
weak heart, Graves' disease, are passed in review from the
neurosis standpoint. Dr Goodhart's remarks are of value in
drawing attention to the importance of thoroughly sifting each
case for itself, and the futility of treating them all alike, because,
forsooth, *some* of the symptoms pointed to the diagnosis of a well-
known disease.

The third lecture is devoted to the neuroses of abdominal
organs, and here Dr Goodhart is most happy in his treatment of
so vast a subject. His observations on diet and the habits of
busy men and "delicate" women in relation to meals are
delineated with much force and precision. The diagnosis of
"torpid liver," the refuge of the doctor, comes in for a good
deal of bantering on the part of the author, and once more the

importance of treating the patient and not the "complaint" is emphasised.

These lectures are pleasantly written and clearly printed. They can easily be read by the busy practitioner at the end of his day's work without exerting his mind too much, and at the same time give him food for reflection in the treatment of the cases he may have under his care, into which the neurotic element, as is rightly thought by Dr Goodhart, plays nowadays so important a rôle, and one which it behoves medical men to recognise early.

SYLLABUS OF LECTURES ON THE PRACTICE OF SURGERY, ARRANGED IN CONFORMITY WITH THE AMERICAN TEXT-BOOK OF SURGERY. By N. SENN, M.D., Ph.D., LL.D. (*Chicago–Philadelphia: W. B. Saunders.* 1894.)

THIS work, in shape and size, closely resembles the pocket note-book commonly used by reporters. It contains 220 pages of closely printed matter, arranged in very systematic form, the author having attempted, under many heads, to catalogue all the points that arise successively in the consideration of every form of surgical disease and injury.

There is a short alphabetical index of regions, organs, diseases, and injuries, sufficient to guide the reader to their place in the syllabus. The work is intended as a guide to teachers of surgery, to whom the various subjects are presented in a systematic, clear, succinct, and practical manner, ready for use in the lecture-room; also as an aid to students for their own purposes. It is an elaborate list of topics to be taught by teachers and to be learnt by students, but is neither intended nor adapted to take the place of any more extended work. It is not to be regarded as a short-cut to surgical principles and practice, which necessarily have to be learnt otherwise; but this handy manual may serve the purpose

of presenting, ready-arranged, the various heads under which every form of surgical disease and injury may be conveniently considered in systematic order.

There is no occasion to say more about the work here, as its purpose has been sufficiently indicated, and it may fairly be deemed a successful attempt at the objects professed. We are not admirers of everything that comes from the pen of its prolific author, and have already had occasion to criticise unfavourably a former work of his; but for this syllabus, as far as it goes, we have small blame and much praise to offer.

HANDBOOK OF OBSTETRIC NURSING. By F. W. N. HAULTAIN, M.D., and J. H. FERGUSON, M.D. (*Edinburgh: Young J. Pentland.*)

THE authors of yet another book for obstetric nurses tell us in their preface that the knowledge necessary to gain the diploma of the Edinburgh School of Medicine must be acquired in three months. What can be thought of the value of such a diploma, or of the so-called school that grants it? The book before us has run to a second edition, which shows it is in demand, and suggests that the authors are also examiners for the aforesaid diploma. We cannot but feel sorry for those women who "have no special previous training," and yet have to get up this book in three months, for to them it must be as Greek. Perhaps the examiners excuse a knowledge of the technical terms the authors are so unsparing of. To us it seems they are at quite unnecessary pains to put in such technicalities as—" *hydatidiform degeneration of the chorion, hydrorrhœa gravidarum, spondylolisthesis,*" &c., through all the vocabulary of terms which may be required by a medical student, because he must meet them in technical literature, but which help no one in practical work.

In general, the information conveyed in the book is clear and

concise, though sometimes more suitable to the medical student than the midwife, as where directions are given for emptying the uterus in inevitable abortion. The style is too much that of lecture notes to be inspiring, and illustrates the difficulty of teaching down to the level of uneducated women instead of the ordinary student. We regret we do not think the book suited to the requirements of those for whom it has been written, and hope the authors will, in another venture, give us something which less distinctly reminds us of notes, even though of the lectures of their most estimable teacher Dr Halliday Croom.

The publisher deserves a word of commendation for the excellent way in which his part of the work has been done.

ESSENTIALS OF THE DISEASES OF THE EYE, NOSE, AND THROAT. By EDWARD JACKSON, A.M., M.D., *Professor of Disease of the Eye in the Philadelphia Policlinic and College for Graduates in Medicine; Attending Surgeon to Will's Hospital, &c.;* and E. B. GLEASON, S.B., M.D., *Surgeon in charge of the Nose, Throat, and Ear Department of the Northern Dispensary of Philadelphia, &c., &c.* (*Second edition, revised. Philadelphia: W. B. Saunders,* 925 *Walnut Street.* 1894.)

THIS volume consists in reality of two separate works bound together in one cover. There is no necessary connection between the two subjects, and it is not easy to understand why each author has not published his own work separately. As it stands, the volume may be described as a series of examination papers, the questions being answered with more or less fulness and clearness by the authors. This method may be useful to students who want to "get through," but we can hardly think it is the best way of teaching ophthalmology and laryngology. The illustrations are numerous and fairly good, and the printer has done his work well.

NOTES ON NURSING IN EYE DISEASES. By C. S. JEAFFRESON,
M.D., F.R.C.S.E., *Senior Surgeon to the Northumberland,
Durham, and Newcastle Infirmary for Diseases of the Eye,
&c., &c.* (*Bristol: John Wright & Co.*)

THIS little volume is from the pen of a well-known ophthalmic
surgeon, and embodies his views and practice on the subject of
nursing in eye affections. It "does not pretend to be a com-
plete manual of nursing"; and although we think it contains
some recommendations of questionable soundness, the directions
and information it gives may be read with advantage by nurses
generally, and we particularly commend the chapter on the
management of the operating theatre and the instruments.

A TEXT-BOOK OF THE DISEASES OF WOMEN. By H. J. GAR-
RIGUES, *Professor of Obstetrics in the New York Post-Gradu-
ate Medical School.*

WE are told in the preface that this book is written with the
object of meeting the wants of " the large class of physicians who
have not had the advantage of hospital training, and who go to
a post-graduate school to learn gynæcology," and " also of the still
larger class who find it impossible to go to a post-graduate
school." Finally, we are told it is intended for the student; so
that apparently the book is written for a rather large portion of
the medical profession.

The aim of the book is to be a practical work to help the
general practitioner " to make a diagnosis, and to teach him how
to treat the different diseases of women."

The book is essentially American, both in its aim and in the
way it is written.

It may possibly be of value to the American general practi-
tioner situated in the wilds, and out of reach of consultation with

a professional brother, when he is hard pressed, and is bound to act for himself. He will find, if he consults this volume, that he has all possible methods of treatment laid before him, but he will search in vain for the advice that will guide him in the choice of any remedy; he will simply find a catalogue of remedies through which he may wade, hoping for the best.

Here, in England, we are glad to think that we already possess text-books of greater value than the one under discussion. The book is certainly not at all suitable for students.

The general plan of the work is very complicated and puzzling. The book is first divided into two sections, "General" and "Special"; it is further divided into 15 Parts and an Appendix, and finally into innumerable chapters. The chapters certainly have the charm of brevity—one of them consists of $6\frac{1}{2}$ lines, and another of $3\frac{1}{2}$ lines: we fail to see the advantage of this extreme subdivision. It is quite out of the question, in the space allotted, to attempt a systematic review of this book: it will only be possible to make a few general remarks on the work, and call attention to some points which have especially struck us on perusing it.

The main fault in the book is the scrappy, disconnected way in which it is written, and the entire absence of any attempt at literary style: the very concise manner used reminds one forcibly of a telegram; this may be convenient for the busy practitioner for whose benefit the book is primarily written, but it certainly tends to make the book difficult to read, and in places the meaning of the author is liable to misconstruction.

To quote only two out of many instances:—1st, Under the chapter Dysmenorrhœa, we cannot think that the author intends to recommend removal of the uterine appendages for dysmenorrhœa, and yet we find it mentioned in the ordinary way under the heading "treatment," without any qualifying statement of any kind. This is surely a rather dangerous piece of careless writing. Again, under the chapter Foreign Bodies in Vagina, we read, "as a rule, the object can be removed through the vulva, but in exceptional cases it has been found advantageous to withdraw it through the rectum or bladder." This sentence, standing

by itself without any explanation at all, appears to us to be very liable to be misleading, and likely to land the practitioner who may trust to this book as his guide in a very awkward predicament.

The book is well printed and well got up, with numerous illustrations, which are of very unequal merit.

SPRAINS: THEIR CONSEQUENCES AND TREATMENT. By C. W. MANSELL MOULIN, M.A., M.D., F.R.C.S. (*Second Edition*, pp. 150. *London: Lewis.*)

THIS small work opens with a short introductory chapter, devoted mainly to a plea that more consideration should be given to the subject of sprains, and drawing comparisons between the care devoted to simple fractures and that shown to sprains. The contents are divided into two parts,—Part I. dealing with the subject in a general way—their nature; the after consequences; the treatment, and so forth; while Part II. discusses special sprains. Certain matters that belong rather to the general principles of surgery have been wisely omitted from the present edition, with the result that the volume is slightly smaller than its predecessor.

All will agree with the author as to the necessity of prompt attention in this class of injuries, as every minute of delay renders the diagnosis more difficult. Mr Mansell Moulin is a great advocate of massage from the earliest possible moment, but his directions (p. 36) appear to require so much anatomical knowledge as to preclude any nurse undertaking the duties, while one cannot help feeling that his happy results—as shown in the following quotation—are somewhat contrary to general experience:—"The limb may be swollen; movement may be very painful; the skin may be tense and shining; much too hot to the touch, and exquisitely tender; under proper massage all this vanishes as if by magic." Many curious cases of stiff

joints having their utility restored by an accident are recorded.
The description of compression as a method of treatment
is very good, and among special sprains may be mentioned
" lawn tennis leg," of which there is an excellent description,
while the treatment is rather original. Notwithstanding the
author's statement that no element of hysteria was discoverable
in the case mentioned on p. 82, it seems difficult to understand
the rapidity of the cure by faradisation on any other hypothesis.
The book is well worth reading; and although it contains nothing
particularly new, the fact that a second edition has so soon been
called for shows that it has supplied a want.

THE HYGIENIC PREVENTION OF CONSUMPTION. By J. EDWARD
SQUIRE, M.D., London, M.R.C.P., *Physician to the North
London Hospital for Consumption and Diseases of the
Chest, &c., &c.* (Pp. 194. *London: Charles Griffin & Co.*
1893.)

IN order that the rationale of preventive measures may be more
thoroughly understood, the author, in Part I. of his book, which
extends to page 53, treats of " The Nature of Consumption," in-
cluding not only its histology and bacteriology, but also the
modes in which it is spread, hereditary tendency, and the local
predisposition induced by disease or injury to the lung or
pleura.

Then follows the study of hygienic prevention; and finally
there are added gratuitously a few chapters on the hygienic
management of early consumption. Viewed as a whole, it may
be fairly said that Dr Squire places before the profession and
the public a very fair statement of the question in the light of
present-day knowledge. On some bacteriological points, how-
ever, the author's statements are not in accord with the views
of the best authorities; as, for example, where it is said, in refer-
ence to the tubercle bacilli, " they are destroyed . . . by drying."

Again, on page 19, the following sentence is surely misleading:—
" Tubercle bacilli may possibly be expelled in the expired air in
respiration, but if so they will not be carried far, for they will
soon settle down in the dust; and as the temperature of the air
is rarely sufficiently high to maintain the vitality of the tubercle
bacillus, active infection is not carried far by the air."

Tubercle bacilli may be expelled in the abrupt expiratory
movement of coughing, but are very unlikely to come away in
ordinary respiration. If, however, they are thrown into the air,
they will certainly retain their vitality at ordinary temperatures,
and may be wafted any distance by the wind.

Acknowledging the necessity for the destruction of the infec-
tive particles, Dr Squire fully realises that, for the efficient
protection of a man against consumption, it is of first-rate
importance that he be provided with a thoroughly healthy and
vigorous body—sound in wind and limb. With this object his
supervision would begin very early. In fact he would, in the
first place, carefully select his parents, he would pilot him
through the " nine long months of ante-natal gloom," and then
receive him into a thoroughly hygienic nursery, where his feed-
ing and clothing would receive the strictest attention. Now,
inasmuch as boiling kills tubercle bacilli, and condensed milk,
Nestlé's and Mellin's foods have been well boiled in their pre-
paration, our author looks upon them with special favour.

He follows the boy to school, and takes care to supervise his
diet and his dormitory, and to see that he is not supplied with
more than a hygienic quantity of fagging or Greek verbs.
Having brought his charge to the threshold of manhood, he does
not desert him. He carefully chooses a profession or occupation,
having a keen eye to sunlight and ozone. In the chapters we
have just referred to, our author quite surprises us with minute-
ness of detail. The chapter upon choice of occupation is an
excellent one, one of the best in the book, and it is followed by
others equally good on " State Hygiene."

The diffusion of literature of this sort is sure to be of distinct
value to the community. The usefulness of this book, however,
is, we think, greatly lessened by one important fault. We

imagine that the author, before sitting down to write, hesitated as to whether he should address himself to the profession or the public, and regarded, as a happy solution of his difficulty, the idea that he should cater for both. To succeed in doing so would be extremely difficult; and we feel assured that had our author chosen one party or the other, and proceeded accordingly, the result would have been more satisfactory to himself and to his readers.

ON THE FEATURES WHICH DISTINGUISH EPIDEMIC ROSEOLA FROM MEASLES AND FROM SCARLET FEVER. By CLEMENT DUKES, M.D., B.S. (Pp. 39. *Lond.: J. & H. Churchill.*)

THIS admirable little pamphlet is a reprint of a paper read before the Medical Officers of Schools' Association. The address is divided into nine short chapters, and in that on nomenclature we are pleased to see that Dr Dukes begs the term " German measles " may be abandoned, using instead the technical term " epidemic roseola," or the popular name " roserash." Some will read with surprise that Dr Dukes thinks when a boy is said to have suffered from measles twice, it only means that he has had attacks both of the English and German variety. On the protective character of one attack of infectious disease he speaks with great confidence, thus:—" Founding my statement on an experience of twenty-five years of continual practice amongst children, I can assert that I have never seen, for all practical purposes, any real instances of children suffering from the same infectious illness twice ; but I can bear witness to an endless number of errors in diagnosis, my own included." It is, perhaps, to the tables—most carefully drawn up—attention will be chiefly directed : they show at once the distinguishing features between epidemic roseola, measles, and scarlet fever, and are the most valuable part of a very instructive paper.

An Introduction to Midwifery.   By Archibald Donald,
M.A., M.D.   (*Chas. Griffin & Co.*)

The growing demand for better education of midwives has
naturally caused a corresponding demand for text-books
suitable for the use of midwives. Dr Donald gives us a most
satisfactory text-book, which, in small compass, tells all a
woman need know to take management of an ordinary case
in an intelligent manner. The book is throughout most clear
in style. There can be no mistake as to what is described,
or as to what the pupil is to do. The first three
chapters are taken up in describing the anatomy of
the body sufficiently to make the rest of the book in-
telligible, then comes the physiology of menstruation and
ovulation, which some books of this class omit: we think
the general view is rendered more intelligent by a knowledge
of these most important factors in a woman's life, even though
authorities do not agree as to their precise relationship to one
another. The chapters on these subjects are short, and each
forms a complete lesson.

After describing the progress and management of normal
pregnancy and parturition, Dr Donald has something to say
as to abnormal processes, and is very careful to impress on
the midwife that there is much beyond her province, and that
even when she has mastered the text-book she is still but
a beginner. In dealing with antiseptics, Dr Donald lays
down the rule that no examination should be made without
careful cleansing of the hands to render them aseptic. The
chapter on antiseptics is very good, and contains theory and
practice in a nutshell.

The pupil, throughout the book, is given clear, definite
teaching : it may be considered by some too dogmatic, but
for the class who are to use the book it is much better to be
dogmatic than to give a string of possibilities of what may
be the cause or the treatment of particular cases. We can

thoroughly recommend Dr Donald's book for the purposes for which he wrote it. The illustrations are numerous and clear; the book is well got up, and judiciously divided into chapters and sections, and has a good index. What more can a book need ?

THE AFTER-TREATMENT OF CASES OF ABDOMINAL SECTION. By CHRISTOPHER MARTIN, F.R.C.S. (*Simpkin, Marshall, Hamilton, Kent & Co.*)

MR MARTIN has in this book of about fifty pages given us a clear account of the after-treatment of cases of abdominal section founded on his experience of over one thousand cases, some of which were under Mr Lawson Tait's care. The book has been written not so much for the instruction of specialists, but for those medical men who may have an abdominal case to look after when the specialist is beyond reach, as in the country. We can recommend the book to such, and to all students and practitioners who may be beginning their study of abdominal surgery. We know no book where such full and clear instructions are given. It is only natural that all surgeons will not agree with all Mr Martin says as to methods ; many do not think it needful to keep a patient without even water for forty-eight hours ; again, many surgeons would disapprove of even the single hypodermic injection of morphia, which Mr Martin recommends directly after operation, while others would give the drug more freely. Mr Martin agrees with the majority of abdominal surgeons as to washing out the abdomen, and the use of drainage-tubes. In simple cases he does not wash out or drain. The sections on the diagnosis and treatment of peritonitis are very good; and, in fact, to those interested in the subject, the whole booklet is well worth perusal.

AIDS TO THE TREATMENT OF DISEASES OF CHILDREN. By
J. M'CAW. (*Baillière, Tindall & Cox.*)

THE author of this little work expressly states in his preface
that it is nothing more than a compilation. He wishes to
place before the student and busy general practitioner an
account of the diseases of children in a concise and clear way.
On the whole, the author seems to have accomplished what
was aimed at, though there may be differences of opinion
as to the utility of small books containing so much concentrated
information: we are apt to find them indigestible, but there
are, doubtless, others who can read them with profit. This
book is essentially a boiling down of the larger text-books, and
contains a wonderful amount of information in very small space.
Here and there inaccuracies have crept in : the " strawberry
tongue " of scarlatina is not furred and red at the edges, nor
does it appear in the stage of invasion as stated in page 54 ;
and, again, the author says " common borax and glycerine should
not be used, because it contains sugar."

We consider any book on diseases of children, however small,
incomplete without a chapter on the points wherein children
differ from adults as to temperament, and the course
their diseases run, and as to the methods of examina-
tion and reaction to remedies. Some general direction
as to clothing might have been added to the chapter on
infant-feeding, which is one of the best in the book. As far
as the book goes, it is clear and comprehensive, and its value
is added to by the appendix, which gives some good recipes
for foods and medicines, and tables on pulse, body-weight,
teeth, &c.

WRIGHT'S VISITING LIST. (*Bristol: John Wright & Co.*)

THIS is one of the most convenient Visiting Lists with which
we are acquainted, and it is adapted to suit the requirements
of both general practitioners and consultants.

YEAR-BOOK OF SCIENTIFIC AND LEARNED SOCIETIES, 1894.
(*Griffin & Co.*)

IT is only necessary to say of this book that it fully sustains the high reputation already acquired by previous yearly issues. We commented so recently and so favourably on its merits that nothing further need now be said, except that no other book gives information so wide and yet so exact on the subject of the scientific and learned societies of our country.

A MANUAL OF THERAPEUTICS. By A. A. STEVENS, A.M., M.D.,
 *Lecturer on Terminology and Instructor in Physical Diag-
 nosis in the University of Pennsylvania, &c., &c.* (*Philadel-
 phia: W. B. Saunders.*)

THIS is a small octavo volume of 434 pages, well printed on good paper. As the preface states,—and it is a statement fully borne out by the body of the book,—" it has been prepared especially for students, with the hope that it may serve as an outline of modern therapeutics, to be filled in and extended by systematic study of the larger works."

It contains a fairly good though short introductory chapter on the general physiological action of groups of drugs, followed by a somewhat more detailed account of the individual drugs, arranged in alphabetical order. With the many useful manuals in the hands of British and Irish students, such as those by Mitchell Bruce, Hale White, and Garrod, it is not likely that the work under review will have any large circulation on this side of the Atlantic. Indeed, as a guide to the use of British medicines, it would not be altogether reliable, while even for the official drugs of the United States it is not full enough in its information. Thus, under aconite it gives ung. aconite B.P.,

our only ointment being the unguentum aconitinæ, while it
omits the abstractum aconiti, one of a class of drugs distinctive
of the American Pharmacopæia.

Similar omissions are noticeable under other headings. Thus
the preparations of asafœtida, given by the author as contained
in the U.S.P., are emulsum (should not this be mistura?) pilulæ
aloes et asafœtidæ, pilulæ asafœtidæ, and tinctura asafœtidæ,
while mistura magnesiæ et asafœtidæ, pilulæ galbani compositæ,
and emplastrum asafœtidæ, also contained in that pharmacopæia,
are not even mentioned. Such omissions in a book intended to
be a guide to students are unfortunate.

ESSENTIALS OF PHARMACY. By LUCIUS E. SAYRE, Ph.G., *Pro-
fessor of Pharmacy and Materia Medica of the School of
Pharmacy of the University of Kansas. (Philadelphia:
W. B. Saunders.)*

THIS book is one of a series termed Saunders' Question Com-
pends.

In the preface to the first edition (for a second edition is now
published) the author says, "This little volume has been written
at the request of a few friends, who claim some knowledge of my
method of presenting pharmaceutical topics in a tangible form
to the students as quiz-master. Facing a class with a set of
questions made to suit the hour is a very different thing from writ-
ing a compend, embracing a series of questions in proper sequence
and logical order, such as will comprehend the subject in hand."
We do not quite know what is to be understood by the title
" quiz-master "; but we quite agree with the author that to ask
special questions on special and important points is a very
different thing from trying to present an entire subject in the
form of question and answer. Of the utility or even the possi-
bility of this latter proceeding we entertain serious doubts.

The author himself seems to admit the impossibility of presenting more than a very partial view of the subject in this manner by giving tables, one of which occupies no less than nine pages, that have no reference to questions asked. It is very difficult to see what advantage can be gained by prefixing the question or request to the student to "name the official alkaloids" to a long list of those alkaloids, extending over nearly three pages. If, however, anyone's power of retaining in the memory such a list is more quickened by such a question or request, than by such simple heading as a "list of official alkaloids," we can see no objection to its being put so. The fact of a second edition being required seems to imply that some readers approve of the method. The directions to be followed in the administration of remedies, or to meet emergencies, are generally clear and sufficiently definite, although brief. It is not very easy, however, to understand what is meant by the following, given under ether :—"If the respiration ceases, the ether should be suspended, the lower jaw '*protruded*,'" &c., &c. If it is meant that the lower jaw should be raised, it would be better to say so. The word protrude, when used in reference to the jaw, applies to what one can do for oneself in conscious conditions, but scarcely to what one can do for another, that other person being unconscious.

On the whole, the book is well written and well got up; and such small slips as hydrargyri ammoniatum for hydrargyrum ammoniatum, naphtol for naphthol, cassia scutifolia for c. acutifolia, iodo-pyrrol for iodo-pyrol (which are almost the only that have escaped the author's vigilant eye in revising the proofs), will be rectified in a third edition. It would have been as well if, among the list of incompatibilities given under spiritus ætheris nitrosi, the risk of decomposition of iodide of potassium had been mentioned, when the two are prescribed together.

AN AMERICAN TEXT-BOOK OF GYNÆCOLOGY, MEDICAL AND SURGICAL, FOR PRACTITIONERS AND STUDENTS. By HENRY T. BEDFORD, M.D., J. M. BALDY, M.D., EDWIN B. CRAGIN, M.D., J. H. ETHERIDGE, M.D., WILLIAM GOODELL, M.D., HOWARD A. KELLY, M.D., FLORIAN KRUG, M.D., E. E. MONTGOMERY, M.D., WILLIAM R. PRYOR, M.D., GEORGE M. TUTTLE, M.D. Edited by J. M. BALDY, M.D., *with* 360 *Illustrations in text and* 37 *coloured and half-tone Plates.* (*Philadelphia: W. B. Saunders.* 1894. *London: F. J. Rebman,* 11 *Adam Street, Strand.*)

THIS is a very complete and comprehensive work, and we think fully entitled to the place claimed for it by the authors. A really good book requires no justification of its existence, and no apology for its compilation. The preface tells us that the rapid advances made during the last few years, and still making, created an almost constant necessity for a revision of the works on this subject. " For this reason, for the purpose of presenting gynæcological surgery and treatment as it is practised in America, the country of its birth and of its most substantial improvements and progress, the present text-book has been prepared by American authors, all of whom are teachers of this branch of surgery in the leading medical schools and hospitals. It is thoroughly practical in its teachings, and is intended, as its title implies, to be a working text-book for physicians and students. . . . . . Illustrations have been depended on in great measure to demonstrate and explain the anatomy of the parts considered—a method of dealing with the subject which has relieved the text of much irrelevant and cumbersome matter." The work is dedicated " to the Medical Profession of America by their co-workers, the Authors."

The first chapter gives full instructions as to commencing and dealing with a gynæcological case, and lays stress on the necessity of cleanliness, refinement of behaviour, and patience, all of which are everywhere and at all times indispensable. For a vaginal examination, the dorsal position is recommended as the best. We, on the other hand, should hesitate to say

which is the better, the dorsal or the lateral; it is frequently
desirable to examine a patient in both. All sorts of instruments
and appliances for examination are either described or figured.
They do not differ materially from what we ourselves are
accustomed to. Gradual dilatation by means of sponge, tupelo,
laminaria, cornstalk tents, have now fallen into disuse, we are
told, except in isolated cases.

A very good chapter is that on the Technique of Gynæcological
Operations. It contains a clear and full account of sepsis, &c.,
technique in general, the duties and responsibilities of the
operator and his assistants, a table of instruments required,
instructions for cleansing of the hands and fore-arms, recom-
mending, by-the-by, a hot saturated solution of permanganate of
potash, and, for removing the stains, a hot saturated solution of
oxalic acid; ligature and suture materials, and the method of
preparing and sterilising them, dressing sponges, &c.; gauze, the
preparation and use of the Mickulicz gauze drain in the place of
glass ones, and the details of plastic operations in general.
Here we note an appliance called Kelly's leg-holder, but no
mention of Clover's crutch, a far more effective apparatus, but at
the same time not quite so portable. It is, in fact, merely a pair
of straps or bandages passing under the thighs, which are then
flexed, when the ends of the two are hooked together behind the
neck. The ovariotomy pad figured on page 75 is probably a
less efficient, but at the same time less formidable piece of
apparatus than the one to which English gynæcologists are
accustomed. As regards closure of the abdominal wound after
laparotomy, we are pleased to notice that the authors advise a
separate layer of sutures for the peritoneum, and that the
interrupted sutures should be tight enough, but not too tight:
operators will know what this means.

A fine powder of boric acid and iodoform (7 to 1) is recom-
mended for dusting over the wound after closure. There is no
harm in such a sprinkling, but it places the wound in a rather
more messy condition when the time comes for the stitches to
be taken out, and no wounds could do better than those in
which nothing whatever but a dry cyanide or iodoform gauze

dressing is used. It is superfluous. It is only fair to add, however, that the simpler method is also mentioned as another and effective one.

The chapter on Menstruation and its Anomalies contains nothing new or startling, and its teaching may be thoroughly relied on. In our opinion, however, something would be gained as regards clearness of expression if amenorrhœa and suppression were not used or regarded as synonymous. Some authors always mean by the term amenorrhœa, the primary or permanent amenorrhœa of our authors. The subject of "Sterility" is not one of those in which "rapid and progressive advances" "have created an almost constant necessity for a revision." The chapter on Anomalies of the Female Generative Organs, Genital Tuberculosis, Diseases of the Vulva and Vagina, are quite equal to what is generally found in works of this description, and here it is that most of the familiar wood-cuts are to be met with. Coccygodynia, however, can scarcely be comprehended in either branch of the group of anomalies.

Coming to inflammatory diseases of the uterus, and especially of the lining membrane of the interior, our authors make the diagnosis of cancer delightfully simple and easy. All we have to do is to procure a scraping of the membrane in question, and on examination under the microscope, if the epithelial cells are deposited in more than one layer, it is more than suspicious. "In all forms of inflammation of the endometrium," they say, "the epithelial cells are deposited in but one regular row of single cells—never in layers. Beginning cancer may readily be distinguished by three things : the glands are not only increased in number, but are many times larger than normal. The epithelium lies in layers, and *the epithelial elements invade the subjacent tissues later on.* Therefore, when examining curette scrapings, unless they present but one thickness of epithelium arranged about the glands as one regular layer, the case must be looked upon with suspicion." There may be looseness of expression here, but the sense is clear enough ; but, at the same time, we doubt whether the diagnosis of early cancer is such a simple matter as our authors teach. As regards

the general teaching respecting the different forms of inflamma-
tion, the standard is well maintained throughout. The section
devoted to treatment by curettage may be taken as a sample.
The list of instruments required is full, the position of the
patient described (the lithotomy position), the antiseptics and
method of thoroughly sterilising the vagina, the instruments, and
everything likely to come into contact with an abraded surface.
The details given are minute, and very properly so, for it is by
attention to detail that the interior of the uterus can be handled
with comparative safety, we had almost said impunity; and, in-
deed, this is equally true of almost all surgical procedures. In
this connection a preference is shown for mechanical lever
dilators, such as Goodell's or Nott's, and for reasons we cannot
quite appreciate. Nothing can be simpler, and more delicate and
more under control, than a well made and finely graduated modified
Hegar, and those who are accustomed to the use of such are
inclined to look with a shudder on the grossly powerful instru-
ments recommended in the text. Discussing the propriety of
curettage in acute pelvic inflammations, the authors say : " The
sequum of pathological changes must be either endometritis,
salpingitis, and peritonitis, or endometritis, metritis, pelvic
lymphangitis, and peritonitis. The question then is proper :
Does this causation endometritis cease the moment the pelvic
complication arises ? Surely it does not. . . . . . It is eminently
proper, therefore, in theory, to curette the uterus before dealing
with the sequelæ in all cases of acute or chronic endometritis
with salpingitis or peritonitis. In practice this theory has been
proven correct, and the results positive. Too many successful
operations in cases of both septic and gonorrhœal origin have
been reported by Pryor and Krug to admit of question as to the
propriety of the method."

We admit that our authors are not alone in their
teaching; we admit that there appears to be a tendency
to practise more generally the teaching laid down; at the
same time, we question whether the teaching is scientific, and
whether it is safe *pace* the authorities quoted. It has been
lately shown by Schimmelbusch that pathogenic microbes

pass into the system through recent raw surfaces with surprising quickness. In the course of a period of time, to be measured by minutes, they are to be found in the kidneys and spleen, amongst other organs. They are already masters of the situation before any signs of inflammation are evident to the surgeon. They have the power of self-multiplication also, so that when once they have reached the lymphatics, the tubes or peritoneum, they cannot be overtaken, and they multiply as far as their environment permits. No cleansing of the endometrium or curettage will prevent the full development of their powers. If these powers are lethal, the patient will die, in spite of curetting; if not, she will survive in a more or less maimed condition. The most that curettage can do is to prevent fresh invasions, and this is of problematic value, when germs that may prove fatal are already running riot within the system.

The chapter on Lacerations of the Soft Parts and the mode of management is very full, and the teaching what we should expect from " the country of the birth " of gynæcology.

In regard to perinæum operations, p. 342, the authors speak rather slightingly of flap-splitting perineorraphy. "It in no ways narrows the vagina, and it only partially approximates the levator ani fibres." This may be quite true of the operation as they know it, and if practised according to the direction given in the text; but there is a modification of it, first made known by Ewart, formerly of Manchester, that gives better results than any we have yet seen. Indeed, we may say the results are perfect, and the patient frequently has as good a perinæum from it as she had before she was married.

Having practised both methods for a good number of years, we have no hesitation in giving the preference to a flap-splitting operation, in which no tissue is lost, to a denudation operation, in which a layer of tissue is removed. This is not the place to describe a perineorraphy as we think it ought to be done, but we think we are justified in saying there is a better way than the one taught by them.

The chapter on Uterine Neoplasms is very interesting, rendered clear by photogravures, diagrams, and coloured plates.

Considering the *rôle* played at the present day in gynæcology by pelvic inflammations, it is not surprising that a large space is allotted to it in the work before us (nearly 80 pages). Speaking of operative treatment, they say : "The question of operation is one which must be left the patient for decision, after having fairly placed the facts before her." This sentence, the whole of which is quoted, no one will be disposed to find fault with, so far as intent is concerned, but the same can scarcely be said in regard to its grammatical construction.

An interesting chapter on Ectopic Gestation next follows. Speaking of operation in emergencies, asepis is thought so much of that it is recommended that instruments should be boiled twenty minutes before proceeding with the operation, when, as a matter of fact, and as actually occurred in a case related by the authors themselves, the patient may bleed to death in less time than it will take to boil the instruments. Surely this is a mistaken estimate of the proportionate importance of things. If President Carnot's wounded liver had been compressed with gauze as soon as it could be done, without loss of valuable time in waiting to sterilise everything required, he might perhaps still have been president of the French Republic. Speaking of extra-peritoneal ruptures, we are instructed not to operate unless the special features of any individual case seem to render operative procedure necessary. We are pleased to find such teaching laid down, for there are unfortunately still remaining surgeons who appear to be convinced that any lump discernible in a woman's abdomen ought to be removed.

In the chapter on Diseases of the Urethra, Bladder, and Ureters, excellent rules are laid down for the prevention of cystitis. "Chronic cystitis is always untractable, and may last for years even under the most skilful treatment," expresses a rather pessimistic view to which we should decidedly take exception. In our opinion there is scarcely any troublesome condition in which so much good may be done by patient and systematic treatment. The use of saccharine in rendering alkaline urine acid, is well worth mention, and the importance of keeping the patient in bed is not sufficiently brought out. In speaking of drainage of

the bladder in very bad cases, we are told "the best plan is drainage through a vesico-vaginal fistula," after the method introduced by Emmet. Although not unfamiliar with this teaching, we have never seen it put into practice, and very much doubt whether such a severe remedy is really ever called for. In speaking of the work as a whole, we can confidently recommend it as being well up to date in every part; there is no chapter that cannot be studied with pleasure and profit. As regards diction, there are not a few Americanisms, but these will be looked upon rather as beauty spots than blemishes, provided readers are not too fastidious. As regards illustrations, they are good, many are excellent, and they aid materially towards an easy understanding of the subject-matter. The typography, the hot-pressed paper, and the whole get-up of the book generally, are very creditable to all concerned in its production, and we wish it every success.

In reviewing an American work, printed and published in America, imported and sold in our country, without the imposition of a harassing duty, a feeling of annoyance arises involuntarily that the Americans have not sufficient generosity in them to treat us as we treat them. There is some little compensation, however, in the thought that a narrow, selfish, trades-union fiscal policy does them no good after all. Every American would be ashamed to practise such meanness in his private concerns; the meanness only becomes respectable when it is national.

Edinburgh Hospital Reports. Edited by G. A. Gibson, M.D.; C. W. Cathcart, M.B.; John Thompson, M.D.; D. Berry Hart, M.D. (Vol. II., 1894. *Edinburgh: Young J. Pentland.*)

We gave a very favourable notice of the first volume of these Reports, and have formed an equally high opinion of the second volume. These Reports reflect great credit on the Edinburgh School, and we wish them the success which their intrinsic value richly merits.

TRANSACTIONS

OF THE

LIVERPOOL MEDICAL INSTITUTION.

The Papers appear among the Original Articles.

Medical Cases.

January 16, 1894.

Dr Carter read brief notes on his experience of the hypodermic injection of spermine, especially in organic diseases of the spinal cord. He referred to Dr Brown-Séquard's paper published in the *Brit. Med. Journ.* for June 10, 1893, in which the startling statement was made that no less than 90 per cent. of cases of tabes dorsalis, and 85 per cent. of various other kinds of sclerosis of the spinal cord, were either cured or greatly ameliorated by the remedy. On reading so precise an account, he requested that the treatment should be employed on every patient suffering from the diseases in question admitted under his care into the Royal Southern Hospital, who did not object to its use. Two were at once submitted to a trial, which was prolonged and very thorough, extending in one case over nearly six weeks. There was absolutely no improvement in either, and the patients left the hospital at their own request. The results were exactly similar in other cases that had been under his observation. He could not help thinking, therefore, that reported cases in which cure had taken place were probably those of functional disturbance simply, or produced by removable causes, like that of his patient shown at a recent meeting of

the Institution, where ataxic symptoms of the most pronounced character had followed the use of impure drinking-water, but had disappeared even after a duration of many months under large doses of strychnine,—a kind of treatment which he certainly would not have adopted if the case had been believed to be one of *progressive* locomotor ataxy, with anatomical changes far advanced. Cases reported by Charcot and others, in which, with the most pronounced ataxic symptoms, none of the usual changes in the columns of Goll could be detected post-mortem, must raise the hope that in any given instance a powerful nerve-excitant, such as spermine, may possibly wake up dormant function, but it seems scarcely credible that it can restore sclerosed tissues to the normal condition. The great difficulty seems to be in understanding how so large a proportion as 90 per cent. could be of this character. It should be stated that the fluid supplied to the hospital was prepared by Messrs Symes, as the supply offered to medical practitioners by Drs Brown-Séquard and D'Arsonval had been stopped, owing to the great number of applications.

Dr Carter read notes on piperazine. After showing the drug, and describing its physical and chemical characters, he said that the general belief was that, whatever use it had, depended on its solvent effect on uric acid, which was said to be twelve times as great as that exerted by lithium carbonate. He would like carefully to distinguish between clinical evidence of its utility and the evidence of its chemical action on which this clinical utility was supposed to rest. The former he was disposed, from a considerable amount of experience, to enter-tain some belief in; the latter, for reasons to be stated, he was compelled to doubt. Thus, if given in the usual way, 15 grains a day, dissolved in a quart of pure or aërated water, and divided into three doses, it seemed to exercise an equally beneficial effect in being followed by, perhaps one might say in causing, the dis-charge after some days of a renal calculus, whether the calculus was one of uric acid, urate of ammonium, or phosphate, or even oxalate of calcium. Of course, the effect of so large a quantity of water must be considered and allowed for. He believed that

the drug often diminished and sometimes relieved pain, and he
was permitted to refer to the two following recent cases :—In
one, a married lady residing at Southport, there had been two
previous attacks, the latter of the two fourteen months previously,
and on both occasions the right kidney had been the seat of pain.
Dr Weaver was consulted on November 20, 1893. The attacks
of renal colic were so severe as to necessitate injections of
morphine. On the evening of December 6, when I saw her
with Dr Weaver, we agreed to prescribe an early morning dose
of boro-citrate of magnesia, and 15 grains of piperazine in one
quart of water daily,—a mixture of bicarbonate of potassium,
which had previously been prescribed, to be persevered with.
There was nothing in the patient's history or appearance or the
character of the urine to determine the nature of the stone. I
learned from Dr Weaver that the pains entirely disappeared
after December 6, and that she passed a calculus on the 21st,
which he proved, by chemical examination, to consist of calcium
oxalate, and to contain no uric acid.

The second case, that of a robust, healthy-looking gentleman
residing at Oxton, had been under the care of Dr Preece since
October 28, suffering from left renal colic caused by calculus.
The urine contained a deposit of urates, but no blood or albumen.
Citrate of potass, tinct. belladonnæ, and sp. æth. nitrosi were
prescribed in a mixture by Dr Preece, together with the local
application of an anodyne liniment. On the evening of October
31 we saw the case together, and agreed to give in addition
piperazine in the way mentioned. The pain did not disappear,
but became less acute, and in four days a small calculus was
passed in three fragments, after which relief was obtained. The
nature of this calculus had not been determined.

Whether the piperazine, or the large amount of water, or
both, promoted the expulsion of these calculi or not, it is certain
that in the first case no part of the effect could have been due to
a solvent action on uric acid; and even in the second, till the
nature of the calculus is determined, the possibility of any such
effect must be doubtful.

The following experiments seemed to Dr Carter to confirm

this doubt :—Two uric acid calculi, weighing respectively ·37 and ·62 gramme, were submitted for eight hours to the action of 5 grs. of piperazine, dissolved in 15 fl. oz. of urine, one of the calculi being simply submerged in the urine, and the other placed in a small elastic bag, into which the urine flowed drop by drop. The urine in both cases was maintained at 100° F. When carefully dried their weights remained absolutely unchanged. The urine was acid.

Three uric acid calculi were then treated as follows :—Urine was made alkaline by means of liq. potassæ, the earthy phosphates filtered away, the clear urine divided into two equal parts of 5½ fl. oz. each, in one of which 5 grs. of piperazine were dissolved, the other having no piperazine. Into the alkalised urine containing the piperazine one calculus and into the other urine another was then put, and the urine maintained steadily at a temperature of 100° F. for two days. After careful washing and drying, the calculus in the alkalised urine which contained the piperazine was found to have lost $\frac{1}{11}$ of its weight; the other, $\frac{1}{15}$ of its weight. But during the same period of two days a third uric acid calculus which had been kept in an aqueous 2 per cent. solution of piperazine on a warm mantelpiece had lost no weight.

A weighed dried filter containing uric acid was submitted to a prolonged washing by allowing 2 fl. oz. of a 5 per cent. solution of piperazine to drop into its contents drop by drop. It was then gently washed with water, dried, and weighed, and found to have lost $\frac{1}{10}$ of its weight. A similar filter containing uric acid, and treated in an exactly similar way with an equal quantity of a solution of one part of liquor potassæ and four parts water, lost $\frac{1}{15}$ of its weight.

Other experiments were mentioned, and a doubt expressed as to whether any of them really threw much light on the utility of the drug, which for the present must rest on clinical evidence. Dr Carter thought that this was entitled to some degree of confidence, but the great expense of piperazine made its frequent and prolonged use in hospitals, where its effects, clinical as well as chemical, could be most carefully watched, a matter of

difficulty.   Whatever the nature of its action, it seemed to him, from clinical observation, that it acted more advantageously if the urine was kept alkaline; and this belief seemed to be confirmed by one of the experiments that he had related, though it must be admitted that laboratory experiments could seldom imitate nature close enough to admit of their being made by themselves a sure guide to therapeutic action.

Case of Tumour of Left Occipital Lobe, accompanied by Left Hemiplegia. By Dr CATON.

DR CATON narrated a case of tumour of left occipital lobe, accompanied by left hemiplegia.   The patient, a man aged 36, with history of syphilis, complained of severe frontal headache and impaired vision.   Double optic neuritis, optic spectra in form of coloured rings were present, but in the early stage no hemiopia.   Deafness in the left ear; otherwise all cranial and spinal nerves were in a normal state.   On patient's admission to the Infirmary, he had some vertigo, and memory was defective. Reflexes normal.

Treatment by mercury and iodide had no effect.   The headache and the visual and auditory defects increased.   For about twelve hours he had an attack of acute myopia, supposed to be due to irritation of root of third nerve.   A semicomatose condition came on, accompanied by conjugate deviation of eyes to right, and by left hemiplegia, with loss of left patellar and plantar reflexes.   The degree in which cutaneous sensibility remained on left side was uncertain, but unquestionably sensations of pain were transmitted.   Tumour diagnosed in right occipital lobe.   On post-mortem examination, the right hemisphere was found normal, but a large syphiloma occupied left occipital lobe, pressing upon, and displacing to extent of half an inch, the left crus.   Dr Caton attributed the hemiplegia to irritative inhibition, dependent on stimulation of sensory tract.

Dr DICKINSON thanked Dr Caton for his paper, and remarked that the case related possessed especial interest for

him personally, inasmuch as he had met with one of a similar
character in his own practice at the Northern Hospital in 1876.
This case had attracted considerable attention at the time; it
had been brought before the Medical Institution, and the full
particulars were to be found in the " Liverpool and Man-
chester Medical and Surgical Reports" of 1878.   Dr Dickinson
briefly referred to some of the recorded cases, as far back as
one by Morgagni in 1761, of this so-called " direct " paralysis,
and to various explanations proposed from time to time by
competent authorities of so peculiar and rare a phenomenon.
None of those explanations could, however, be regarded as
wholly satisfactory or final; but perhaps that offered by Dr
Brown-Séquard, and alluded to by Dr Caton in his paper
(" The Inhibitory Action of a Cerebral Irritation "), afforded the
most reasonable solution, in the present state of our knowledge,
of this abstruse and difficult problem.

Dr BRADSHAW pointed out that purely functional hemiplegia
was now and then met with, and instanced a case under his
care where death ensued, and both brain and cord were found
normal.   He suggested that in Dr Caton's and similar cases
the hemiplegia was functional, its coexistence with the tumour
being only a coincidence.   An occipital tumour would cause
sensory rather than motor paralysis from its proximity to the
sensory crossway.

Mr THELWALL THOMAS suggested the possibility of the
tentorium cerebelli guiding the pressure towards its own
concave aperture, and there acting downwards on the
corpora quadrigemina and crura, telling more on the opposite
crus.

The case was interesting as demonstrating how the earlier
symptoms in many brain tumours assist in localising them, and
the confusion often produced by later and larger extension, and
confirms Horsley's statement that cerebral gummata are not
affected by drugs.   The number of operations performed for
brain tumour without discovery of the growth had been great,

localisation being in many cases more deceptive the greater the growth.

Professor GOTCH remarked that this extremely interesting case showed the difficulties in drawing conclusions from symptoms produced by large irritating lesions of the complicated afferent side of the central nervous system. He suggested that in this case both the large lesion and the general condition would probably combine to inhibit the activity of all the sensori-motor centres in both hemispheres, and that some special agent might then contribute further to block the feeble flow of nervous impulses from one, viz., the right hemisphere. This, he thought, might be the distortion which the tumour, pressing as it did on the dorsal portion of the left crus, necessarily caused in the position of the ventral fibres of the right crus. These were certainly considerably displaced, and experiments had shown that a small amount of twisting rendered nerve fibres incapable of propagating nerve impulses; thus the discharge of the right hemisphere being feeble would be inadequate to pass the block, and paralysis of the left side might be caused by the tumour. As regards the deviation of the eyes, there still existed much uncertainty as to the function in man of the cortical centres for these movements.

February 1, 1894.

(1) *Carcinoma of the Gall Bladder, with diffuse infiltration of Liver.*   (2) *Healing Typhoid Ulcers, from a case without temperature, diarrhœa, or spots.*   By Dr ABRAM.

A Case of Twin Pregnancy. By Dr E. T. DAVIES.

MRS D., aged 40. Primipara. Membranes ruptured, with gush-
ing discharges of liquor amnii for a week before labour set in.
During this time there were no labour pains. The stomach was
irritable, rejecting everything patient partook of; bilious vomit.
The most striking symptom at this time was the rapid and
extreme emaciation which the patient underwent, accompanied
with a dirty, brownish, blotchy coloration of the skin, at
once suggestive of septic absorption from a dead fœtus in
utero. On questioning the patient, she emphatically said she
felt the movements of the child distinctly and strongly, and on
auscultating over the lower abdomen, the fœtal heart-beats could
be readily heard. After a week's interval labour set in, although
the pains remained weak and ineffectual. After allowing labour
to proceed naturally for a night and day, the patient was
obviously becoming exhausted; I therefore deemed it advisable
to terminate labour by means of axis-traction forceps. A healthy,
living female child was extracted, which had the umbilical cord
twisted round its neck and both its arms. On proceeding to
express the placenta, it soon became apparent that the uterus
was not emptied, and on making a vaginal examination, the
finger came upon a soft cystic swelling, with loose, hard masses
floating in it.

This mass was easily delivered by pressure from above, through
abdominal parietes, and traction by the fingers from below, per
vaginam. This turned out to be a dead, macerated, hydro-
cephalic fœtus, some time dead, how long is difficult to say, the
skin peeling off, and tissues partially decomposed. It was
obvious now that this was the cause of the rapid emaciation and
sepsis of the mother. The interesting points in connection with
the case are :—(1) Was it a case of superfœtation? I am
inclined to think not, for there appeared to be but one amnial
sac. And (2) What was the cause of the death of one of the
fœtuses, whilst the other one survived, and is a perfectly healthy,
full-sized, and well-developed child? The mother is progressing
favourably towards recovery.

Skin Case—probably Tubercular. By ANDREW STEWART,
Surgeon to Birkenhead Borough Hospital.

S. H., aged 9, admitted December 30, 1893, suffering from warty
patches, as seen on base of forefingers, elbows, knees, palm of
hands, and tips of some fingers.

History.—Family—father dead (heavy drinker); mother alive.
Has had 10 children; 8 are living. 1 died of convulsions, aged
nine months; 1 died of measles, aged 1 year 11 months. Mother
was not strong while pregnant with this patient.

There is no distinct history of syphilis, but the mother, about
two years ago, suffered from sore throat, and lost her hair. She
has never had a miscarriage.

His mother states that he has always been the subject of a
rash, chiefly on chest and back.

Three years ago he had measles, and about three months
afterwards the sores began to appear as red swellings. About
two years ago he was in hospital for necrosis of one of his
fingers.

Diagnosis —— ? *Treatment* — Ol. morrh. et syr. ferri iodi
internally; and under this for past six weeks he has improved.

Mr RUSHTON PARKER thought it a case of lupus, or at any
rate a lupoid disease of the skin, such as he should treat by
scraping. He had not seen much of this form in young persons,
but he once had an extensive case of the kind in a man of about
sixty, which he treated successfully by scraping with a blunt-
pointed bistoury.

Dr BARENDT:—I think the case is one of lupus verrucosus.
The treatment I recommend is the application of salicylic
acid plaster muslin with creasote, to the various patches. When
the horny layer is thoroughly removed by this means, the
needle point of Paquelin's thermo-cautery, or some other power-
ful caustic, may be then used to destroy the nodules.

Dr GRIMSDALE read notes of a case, and showed a specimen of cancer of the cervix uteri, coexisting with a three months' pregnancy, in a woman aged thirty-four. The uterus and its contents were removed through the vagina. The woman made a good recovery, and now, eight months after operation, remains quite well.

March 1, 1894.

Case of Myxœdema with Glycosuria, treated with Thyroid Extract. By W. MACFIE CAMPBELL, M.D., Consulting Surgeon, Northern Hospital.

I HAD known Miss F.'s family and appearance for many years, and had prescribed for her as a child; and when she came to me in May 1889, her appearance was so altered that, although only about twenty years old, she looked forty. The face was swollen, the cheek projecting, eyelashes gone, head almost bald; her girth was enormous, her movements slow, and her brain clouded. Her history was, briefly, that she had good general health till the last two years, when, as she felt herself growing stout, she was put under the care of a medical man in Liverpool, who treated her with diets and various remedies for stoutness. Her symptoms becoming worse, her friends took her to see Dr Crosby in London, a most able practitioner. He at once diagnosed myxœdema, and took her next day to see Dr Ord, who confirmed his report. Dr Crosby sent her down to me with a letter, in which he remarked that he had found a trace of sugar in the urine, but that next day it was gone. He had prescribed for her pot. iod. and codeia, which treatment I continued.

May 16, 1889.—Her condition at this date, my first visit, was —her appetite was poor and capricious, the bowels confined, and she had not been unwell for twelve months. She was irritable, apathetic, lazy, stupid; if her book was out of reach, she would not rise to get it, and would sit downstairs all day rather than go up for anything. Her girth was enormous—waist 28 inches,

hips 45 inches. Her breasts fell down in front like travellers' pictures of African women. Her abdomen was the size of an eight months' pregnancy, and was seamed with *linea albicantes*, exactly resembling a pregnant abdomen. Her legs and arms were thin, and the skin harsh and dry; she never perspired, was an eyesore to her friends, and a burden to herself. Her weight was 9 stone 13 lbs., and had been 12 stone 5 lbs.

For examination of the urine, two specimens were sent May 16 and 17, 1889.

May 16.—Evening, sp. g. 1032; no albumen; sugar abundant.

May 17.—Morning, sp. g. 1013; no sugar. Half a grain of codeia was given at night, and in a week the evening sp. g. was 1034, the morning 1016, and sugar decidedly less.

In June the sugar was still less, but the sp. g. kept high. I then put her in addition on jaborandi, the tincture, m. x. t. d. s., and in August I note her weight was 10 stone 6 lbs., the sp. grs. 1030 and 1020, and the sugar corresponding. Strict anti-diabetic diet was persevered in, with jaborandi, and in September the sugar was normal, the weight 10 stone 2 lbs., but the myxœdema was no better.

Such remained the condition till the middle of next year, the sp. g. night and morning differing about ten units, but no sugar in excess, and the weight up to 11 stone 2 lbs.

1890. In July, however, the sp. g. at night 1045, sugar very abundant; sp. g. morning 1020, sugar none; and this remained the condition of affairs in spite of diet, codeia, pot. iod., and jaborandi.

1891. In July, a year after, the record was—evening 1034, no sugar; morning 1030, sugar trace.

1892. In March, sugar was normal. In September, the sp. g. morning 1040, evening 1030; abundant sugar.

1893. In January (28th) I commenced Murray's thyroid extract (Brady & Martin), 20 m. three times a day by the mouth. On February 1 she had diarrhœa and nausea, and the dose was lessened to 15 m. By February 20 she had consumed eight drachms, and was visibly improving. She got in time to like the dose, and would not be without it, and still (January 1894)

she is taking small doses regularly. I unfortunately cannot pass round an early photograph of her, as she would not consent, but after a month or more of treatment she consented, and the result I show you. It was a vast improvement upon her former state, but the characteristics of the disease may be observed. I send round a photograph of a month ago, and the change is apparent. Weight, 9 stone 4 lbs.; waist, 22 in. (against 28 in.); hips, 37 in. (against 45 in.). Her hair is soft and moist, her skin supple, her intellect bright, and she is as active as before her illness. There is also a sign of improvement in the glycosuria, of a more permanent nature. Since last March each report is " less sugar," " sugar normal," but the sp. g. still keeps high, with always the great difference between night and morning.

There was an interesting episode in this case. In November 1892, she stumbled getting out of a 'bus and barked her shin. She had no sensation of pain, but felt the blood in her stocking. On uncovering the leg, a large flap was found torn down, exposing a surface size of an orange. This I brought together; but as I found it all sloughed, and healing was very tedious until January, when the thyroid extract was begun, when improvement became rapid. The parts which had cicatrised became soft, and the extreme hyperæsthesia which appeared round the wound disappeared, and in a short time the skin resumed a normal soft, mobile condition. The usual lotions—opium, Friar's balsam— had all been employed, but the real improvement coincided with the administration of thyroid extract.

I have not been able to find this complication of glycosuria recorded before. Albuminuria is common enough, and in correspondence with Dr Ord and Dr Crosby I find that they could assist me little in this matter.

I have been much indebted to the assistance of Dr Burns Gemmel for his examination of the urine, a synopsis of which I pass round. Although her general condition is so greatly improved, I still consider the sugar is checked by her diet more than the thyroid extract.

March 29, 1894.

DR STEEVES moved the following resolution, which was seconded by Dr Carter, and carried unanimously:—

" That the members of the Liverpool Medical Institution, fully recognising the great importance of an efficient system of Registration for Plumbers, are of opinion that such registration should, without delay, be placed on a firm legal basis by Act of Parliament," and that this be sent as a memorial to the President of the Local Government Board, Sir Walter Foster, M.P., and Mr Lees Knowles, M.P.

Dr Steeves introduced the resolution by giving a short review of the Registration of Plumbers movement; what had been done by the Worshipful Company of Plumbers of London; and what work had been accomplished through the agency of various working " district councils and centres " throughout the United Kingdom. The time had now arrived when, in the interests of public health, the qualifications of the plumber should be insisted on by special legislative enactment. He said the present resolution was the sequel of the one he put before the Liverpool Med. Inst. on April 12th, 1888, which was as follows:—

" That the members of this Institution are strongly of opinion that an organised and efficient system of Registration of Plumbers should be put in force in Liverpool and district;" and the following addition at the time was added, viz.:—" That copies of the resolution be sent to the Chairman of the Liverpool Health Committee, and also to the Chairmen of the various local boards throughout the district."

Note on a Case of Tetanus. By ROBERT S. ARCHER, B.A., M.D.

TETANUS is, fortunately, a sufficiently rare disease to justify my reading a brief note of a somewhat peculiar case of this affection, which I observed a short time ago.

C. F., aged 15, a telegraph messenger, consulted me, on the evening of Feb. 16th, for a sore throat, which presented

the usual characteristics of an ordinary attack of catarrhal tonsillitis. He complained of pain in the throat, difficulty of swallowing, and slight pain in legs and back. His face had a somewhat anxious expression, was pale, and he seemed a little nervous, otherwise there was no symptom to indicate that he was suffering from anything but a simple attack of quinsy. I prescribed some salicylate of sodium, and instructed him to stay in the house for a few days, directing him, if he felt any worse, to let me know. I heard nothing more of the boy till the evening of Sunday, Feb. 18th, when his mother called on me, and said "he was choking." I saw the patient about 6.30 P.M., and found the condition of the throat much improved, the inflammation and swelling having much subsided, and there was nothing to be seen in the throat to account for the attacks of choking, as described to me by his mother. Before I had seen him on this occasion a local practitioner had been called in, as his mother thought he was dying from what she described to me as "choking spasms." For this he was given some brandy. When I saw him the expression of his face was anxious and fixed, and the eyes were staring, with widely dilated pupils, scarcely at all acting. He was nervous, and in considerable trepidation. He complained of some pain in right shoulder and back of neck, and of constriction across the epigastric region. He occasionally vomited or retched, and there were frequent calls to micturate, when he passed a small quantity of high-coloured urine. There was difficulty in swallowing fluids, he being only able to take a teaspoonful at a time; but he could swallow solids fairly well. A symptom which particularly arrested my attention was the spasmodic nature of his respiration: the chest would become fixed in the position of inspiration, and remained so for about half a minute, and expiration was spasmodic and catchy. He suffered from cramps of the legs, and the two outer toes became rigid and extended; the first finger on either hand became also rigid in the extended position. The pulse was so feeble, running, and rapid that I could not count it. The boy died at 10.30 P.M., four hours

after I had seen him. The spasmodic muscular contractions, I was informed, had commenced on the morning of 17th Feb.; and though they did not appear to be so violent and painful as is frequently observed in tetanus, still the spasms of the respiratory muscles at times were sufficient to make him jump up and get out of bed. The muscles of the back did not appear to be affected, there being no opisthotonos. The case I have just briefly related is one of idiopathic tetanus, there being no history of wound or injury. The boy's mother and he himself were closely questioned on this point.

It cannot be regarded as at all a typical example of the disease, as the two most distinguishing features, viz., trismus and opisthotonos, were entirely wanting. However, I submit that the other spasmodic manifestations, together with the history, were quite sufficient to justify a diagnosis of tetanus being made.

The mode of death was probably by cardiac failure, due to exhaustion of the nervous system, as it was observed that the heart's action was very rapid and feeble; or, perhaps, it may have been due to asphyxia, arising from spasm of the respiratory muscles.

Dr GLYNN asked Dr Archer if it was not possible that his patient had been inoculated through some small and unrecognised wound. He referred to certain cases of tetanus that had come under his notice, where the specific poison of tetanus appeared to have been introduced through slight abrasions or wounds: one, a case of ingrowing toe-nail in a greengrocer who walked about his shop wearing worn-out slippers, and probably became inoculated with the organism of tetanus conveyed in the earth brought with potatoes and other vegetables; another, a case where the specific poison appeared to have been introduced through a slight abrasion of the knee; and another, where it entered the blood through a small cut in the finger.

Dr BRADSHAW pointed out some features in Dr Archer's case that were very unusual in idiopathic tetanus, namely, the early

fatal issue, the difficulty in swallowing, and, above all, the absence of trismus. The case, as related, reminded him forcibly of the symptoms of hydrophobia.

April 12, 1894.

Case of Sudden Death in a Child aged Five Months. By A. C. E. HARRIS, M.B., Physician to Birkenhead Borough Hospital.

MR PRESIDENT AND GENTLEMEN,—The appalling suddenness of the death in this healthy child, and, in my experience, the extreme rarity of such a case, makes me anxious to bring the subject before you, in the hope that "the collective wisdom" of the Medical Institution may be the means of elucidating a satisfactory cause of death.

Previous history.—A well-cared for, well-nursed, closely looked after baby. Never been ill, or ever given its nurse a restless night. In fact, the youngster was never seen by me professionally except when vaccinated at three months. No trouble with the artificial feeding. Parents healthy.

The day of its death.—Sent for because the child had had a crying night, and seemed in pain. *Visited* at 10 A.M. Temperature, pulse, and respirations normal. Lungs, heart, and other viscera right. Abdomen slightly tender to touch, but without tumefaction. Urine said to be scanty. *Diagnosis.*—Intestinal irritation. *Treatment.*—A dose of castor-oil at once; 5 drops of sweet spirits of nitre occasionally during the day. The bowels were copiously moved, and all during the afternoon the child was reported as about himself again. At five minutes to 6 in the evening the babe was started with a bottle by its mother, and left taking it on the head-nurse's knee quite as usual. At two minutes to 6 the nurse, noticing a change, signalled for the mother, who, coming up at once, saw it was death. There was no choking, cough, or struggle, and the *face*

quite *pale*.   The infant was put in a hot bath, &c., and I was
sent for, arriving about a quarter past 6 to find the child dead.
The mother and head-nurse, both most intelligent women, had
kept a sharp look-out all day.

Post-mortem fifteen hours after death. Rigor-mortis well
marked.   A well-nourished, plump, healthy-looking infant.
All the thoracic and abdominal organs healthy.   The cardiac
ventricles in firm systole.   The intestines empty, with no
ecchymoses, adhesions, &c.   A little milk in the stomach
(perhaps about a tablespoonful of fluid and flocculated curds).
Permission not asked to examine the brain.

There you have it.   What was the cause of death?   I
returned " syncope."   Death was from the heart ; there was not
a trace of asphyxia in it.   The cerebral nervous system would
not kill so very, very suddenly.   Why should a healthy heart
stop without a moment's warning ?   Is it that " there are
more things in heaven and earth than are dreamt of in our
philosophy " ?

DR FINGLAND exhibited and explained a new inhaler for
administering ether and nitrous oxide, invented by Mr
Rumboll of Leeds.

Surgical Cases.

January 18, 1894.

*Uterus Bicornis, with Retained Menstrual Fluid in Right Cornu
and Right Fallopian Tube.*   By J. E. BURTON, Surgeon,
Liverpool Hospital for Women.

MARGARET MOLYNEUX, aged 21, a well-nourished and healthy-
looking girl, but with a rough, scaly skin, reminding one of
mild ichthyosis, began menstruation at the usual age.   She has

always been regular, but for the last five years has had dysmen-
orrhœal pain, coming on the day after the commencement of
the flow, and lasting six hours.   The flow lasts three days.

She has always· been perfectly healthy, not having had any
illness of any kind since childhood. She has no leucorrhœa.
She complains of a good deal of pain at the bottom of the
back (sacrum).   The bowels are always confined, and she never
suffers from looseness of them.   When the pain is at its height
she cannot pass her own urine.   Latterly the pain has become
so severe that she cannot continue her work, that of a domestic
cook.

She has been seen by a medical gentleman, who, from the
history, and a local swelling with hardness, comes to a very
natural diagnosis of hæmatocele.

Present state.—Over the abdomen there is slight enlargement
of the right side, with some dulness in the iliac fossa.   There is
tenderness on pressure. *P.v.*, the usual signs of virginity are
present.   The space usually occupied by Douglas's pouch is
completely filled by a firm, tense tumour, that plainly contains
fluid.   It is fixed in position, and cannot be pushed to either
side, or upwards.   The uterus, or what is taken to be the
uterus, is pushed over to the left.

Diagnosis.—A thick, walled cystic tumour in the right broad
ligament, dermoid or hydatid.   (I may say here that I thought
of a hydatid tumour because I once had such a case in a young
woman in exactly the same locality.)

The patient was admitted into hospital on September 4th,
and abdominal section was performed on September 12th.   On
putting my fingers into the abdominal cavity, I brought up a
pear-shaped, thick walled cystic tumour, evidently distended
with fluid.   Near the thinnest part of the tumour was an ovary,
adherent to it by inflammatory bands.   The tumour I ligatured
and removed, but I did not remove the ovary.   On exploring
again I found a second tumour below the one removed, and
lying almost entirely behind the peritoneum, within and below
the spread-out folds of the right broad ligament.   It was clearly
a something that could not easily be removed, and I set to work

to determine the parts and their relations. Passing my hand down to the left, I found a firm body about the size and shape of a man's thumb. I found a Fallopian tube, easily recognised by the fimbriated end proceeding from it, and behind this a small ovary. I then returned to the right side and brought the pedicle into view, and now saw that the tumour I had removed was directly continuous with the larger one, reaching into and blocking the pelvis. The case was now clear—one of uterus bicornis, with regular and normal menstruation from the left cornu, but with atresia of the os of the left side, with retention of menstrual fluid, which had dilated the cervix and body of the uterus, and backed up into the right Fallopian tube. Escape of a portion of the fluid into the abdominal cavity had set up adhesive inflammation at the fimbriated extremity of the tube, and one continuous cyst had been formed, consisting of cervix and body of uterus and Fallopian tube, with but little dilatation of its proximal end, *i.e.* the part where the ligature was applied.

I now determined to do no more at that time, but when the patient had recovered from the operation to open and drain from below.

The patient did well after the operation, except that she complained of very severe pain from what we now knew to be the distended right cornu of the uterus. This was generally relieved by poultices.

On October 4th the patient was placed in the lithotomy position for operation. An examination was made by gentlemen present before the cyst was punctured. Dr T. B. Grimsdale remarked that he could feel rhythmical contractions in the tumour. A trocar was inserted in the lowest part of the swelling, through the canula of which thick, dark, tarry blood escaped. The opening was now enlarged enough to admit the finger. The cavity was washed out, and lightly packed with cyanide gauze.

No reaction; but on the 10th she complained of feeling ill. Her temperature went up to 103·4° on the 11th, and on the 12th her mother took her out, much to our annoyance. This illness

was probably due to an attack of influenza, which had been hanging about the place for some time.

November 23.—Dr Matthews telephoned me that she was still at home; that she was well, or nearly so.

As regards return of the retention, I am inclined to think there will be none, as the opening seemed to grow larger rather than smaller whilst she was under observation, and as the mucous membrane of the uterus will probably always secrete a sufficient quantity of mucus to prevent closure.

Although the case is a rare one, it is probably not unique. Hart and Barbour in their book, p. 495, give a figure of a somewhat similar case from Schrœder, but in that the retention is on the left side, and the Fallopian tube is not involved.

Holman of Boston published in the *Lancet* for 1883 a case in which the fluid was retained in the left horn. (This may possibly be the case given by Schrœder, and Hart and Barbour.) In this case the uterus, with tubes and ovaries, was removed. The doctors seemed determined that patient, at any rate, should never have any more trouble with her uterus.

Lastly, in 1883, a case of uterus duplex was operated on by Thomas of New York, assisted by Emmett and others. Here the cyst was drained through the abdominal wall.

In none of the cases quoted was a diagnosis made beforehand. I venture to think that the treatment adopted by me was the most suitable to the case, as there was no mutilation; and even if the collection returns, which is not likely, a piece cut out of the cyst wall will ensure a permanent cure.

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Compound Fracture of Skull. Removal of Bone and Elevation. Recovery. By W. THELWALL THOMAS, F.R.C.S., Assistant Surgeon, Royal Infirmary.

A BOY, R. E., æt. 9 years, climbed a ladder to a roof 15 feet from the ground, where he trifled with some loose slates; the boy and the slates came down together, and he was probably injured by their sharp edges.

He was hurried to the Infirmary on July 30, 1893, and on admission, although not unconscious, would not answer questions, cried when touched, was greatly collapsed, but moved all his limbs, and had occasional twitches of the right side of the face.

There was a scalp wound an inch and a half long, situated two inches above the left ear; and another, smaller one, below and in front of this. Hæmorrhage from these wounds was severe, and at intervals were gushes of clear fluid—probably cerebro-spinal.

The finger passed into the larger wound revealed an extensive fracture, with depression of the parietal bone.

Operation.—The head was thoroughly shaved and cleansed under an anæsthetic, and an incision, semielliptical in shape, 5 inches long, running through the larger wound and along the temporal ridge, was made down to bone; a flap was turned down. This exposed a fissured fracture running for $4\frac{1}{2}$ inches along the temporal ridge into the frontal bone; the upper margin was a sharp edge; the lower—the parietal bone in the temporal fossa—was depressed and driven under the upper portion to the extent of half an inch; this had caused a crack in the upper piece through the outer table only, about half an inch from the edge, and parallel to the fracture.

The overlapping piece of bone was chiselled away, commencing behind and working forwards, when a periosteal elevator could be inserted in the fissure now exposed, and the lower piece was levered into position, causing a loud snap; some small fragments of bone were picked off the dura mater, the small branches of the middle meningeal which had been torn had ceased bleeding; the main anterior division was intact. A small slit was seen in the dura mater, but it was not considered worth while suturing it. The surrounding parts were thoroughly cleaned with 1 in 40 carbolic lotion, the flap adjusted by suture, and a small drainage-tube inserted at the posterior part of the wound. Dressings, double cyanide gauze and wood-wool pads. That night the temperature ran up to 105°, but came down again to normal in the morning.

Four days afterwards the child became drowsy and dull, and the temperature went up to 104°; on examining the wound, there appeared to be some retention of discharge, so the sutures were removed and the flap was opened up, the parts well irrigated, dusted with iodoform, and over this a bran poultice, sprinkled with borax, applied. By the eighth day all bad symptoms had disappeared, and the boy made an uninterrupted recovery, the wound slowly granulated, a paper-like exfoliation took place, including only the external table of the skull for a quarter of an inch on each side of the fracture, and the boy now presents a firm cicatrix over the site of operation, and his mother states that he is as mischievous as ever.

Ankylosis of the Left Temporo-Maxillary Articulation. Osteotomy of Jaw. Re-implantation of Teeth. By W. THELWALL THOMAS, F.R.C.S.

CLARA O., at 19 years, suffered from abscesses of the left cheek, front and back of the left ear, and one in the scalp, eight years ago, following what she called "erysipelas." She never had discharge from the ear, and one cannot connect the suppuration with any of the fevers.

During the formation and treatment of this condition, the lower jaw became stiff, and soon immovable; so that for over seven years she was unable to open the mouth in the slightest degree, and could only by strong effort push the tip of the tongue irregularly through small gaps between the teeth.

On admission into hospital she was a strong, healthy-looking girl, who had subsisted entirely on fluid nourishment for seven years. There were cicatrices over the site of the abscesses, one over the malar bone, one in front of the tragus, a small one in the scalp above the ear, and a deep depression behind the ear suggestive of mastoid disease. The lower jaw was immovable and poorly developed, being quite half an inch at

the chin posterior to what a normal chin ought to advance to; this caused the lower incisors to be behind the upper ones.

The front teeth were pushed forward at their tips, forming an angle of 45° with the jaws.

The patient was sent by Dr W. T. Clegg for operation.

Under anæsthesia, April 14th, 1893, a right-angled incision was made along the lower margin of the zygoma, and in front of the ear (after an unsuccessful attempt to separate the jaws by gags). The condyle was exposed, with its neck; the glenoid cavity was obliterated by bone. By means of a saw and chisel, the neck was carefully divided, and found surrounded by tough cicatricial material, which bled freely.

A gag was now placed between the teeth, and the mouth forcibly opened to the extent of an inch and a half. Unfortunately, owing to the gag slipping, two lower incisors were knocked out. These were immediately replaced and pressed into position.

The wound was sutured, a small tube used for drainage; in a few days the sutures were removed; a sinus, however, persisted, which led down to bare bone. A small seqestrum came away in a few months, after which the hole closed.

For three months after the operation the mouth was forcibly opened to its utmost, under nitrous-oxide gas, by means of a gag once every three weeks.

A week after division of the jaw, the girl was placed on solid food, and was soon able to masticate meat. The re-implanted teeth were sound and in working order in July, but subsequently an alveolar abscess loosened them; and although they are still in position (January), she cannot use them satisfactorily, and they may have to be extracted. The incisor teeth can be now separated for three-quarters of an inch, and the lateral movement of grinding can be well performed without any pain.

We hope that now that the lower jaw is being exercised, it may develop more rapidly, and diminish the amount of distance between the teeth of the upper and lower jaw in an antero-posterior direction.

February 1, 1894.

MR LARKIN showed two cases he had operated on for pyo-
nephrosis. One, a woman of 24, with a ten years' history, in
whom the disease, though apparently tubercular, seemed quite
localised to the kidney. In her he had completely removed
the diseased organ, which was converted into a large thin-walled
cyst, holding several pints of curdy pus. She is quite well nine
months after the nephrectomy. The other case was a man of
28, who commenced with tubercular cystitis, then prostatitis,
tubercular pyelitis and nephritis. He also had some dulness and
flattening over the apex of the right lung. Mr Larkin scraped
out the abscesses in the kidney, washed out the pelvis and
ureter, scraped out the prostate, and drained. He was shown
(fifteen months after the operation) well and hearty, weighing
ten stones, whereas he was under eight when operated on. There
was at the time of showing some thickening about the right
epididymis, which, however, did not seem to increase.

February 15, 1894.

Card Specimen.

DR BRIGGS showed a uterine polyp which he had removed, with
scissors, two days previously from a woman, aged 41, married
twenty years, and the mother of seven children, of whom the
youngest was four years old.

The knob-like polyp was 4 inches in diameter; it lay in the
vagina, and was attached by a stalk, $1\frac{1}{4}$ in. in diameter, to the
anterior surface of the body of the uterus.

The symptoms had been—(1) uterine hæmorrhage for $2\frac{5}{12}$
years; and (2) a continuous watery discharge for twelve
months.

The growth has the naked-eye characters of a sarcoma.

Abstract of Case read at the Liverpool Medical Institution.

MR HUGH E. JONES read the following case:—

Influenza; acute suppurative inflammation of middle ear, followed two months later by extension of disease through the vestibule to the posterior surface of the petrous bone; extra-dural abscess and caries of petrous bone; extension through petro-occipital suture, sub-occipital periosteal abscess; apparent rapid recovery after operation. Three weeks later purulent meningitis supervened. Trephining and incision of dura mater gave no relief; death in three days.

Cases of Excision of Joints after Injury.   By Mr BANKS.

MR BANKS showed some patients upon whom excision of joints had been done for the results of injury. One was a healthy young man, a woodcutter, upon whom a tree fell in the back-woods of Canada. With great difficulty he was, after some days, brought to a rough country hospital. There it was found that his right femur had been fractured about the middle, and for this injury he was treated. When he got up from bed, however, it was clear that there was much overlapping of the ends of the broken bone, which had, moreover, united in a curved manner. The thigh was thus bowed, and the whole limb considerably shortened. During his stay in bed the patient several times complained about his left hip-joint, which he felt sure was not right, but no particular notice was taken of his complaints. When he began to go about, it was observed that, while his right leg was much shorter than it ought to have been, his left one was decidedly elongated, and the left hip-joint was almost immovable. As he was useless for work, the patient resolved to return to his native country, England, and, landing at Liverpool, came to the Royal Infirmary. He walked with difficulty on crutches. The fracture of the right femur, although badly mended, was sound and strong, but it was obvious that there was a dislocation of the left hip-joint, which

had now existed for many months. A thorough attempt at reduction under chloroform having failed, it was resolved to excise the joint, for the reason that the patient was absolutely unfit for any occupation. This was done by a semilunar incision having its convexity upwards. The femoral head was found lying just below the acetabulum. The femur was sawn through just below the great trochanter, very considerable difficulty being experienced in removing the head, neck, and trochanter. A slow but satisfactory recovery ensued, and, when shown, the patient was walking very well, with the aid of a stick only. There was excellent movement in the false joint in all directions, and, standing on the sound leg, the patient could kick the left one about with great freedom. Owing to the shortening due to the badly mended right femur, the excision on the left side brought the patient's legs just level. He was, in fact, "cut down" by about three inches from his original height. There was no doubt that in time he would be able to resume his occupation.

The second case was that of a middle-aged man, a sailmaker. He was knocked down in a gale of wind at sea, and sustained a dislocation of his right shoulder. The dislocation was not reduced, and it was about four months before he got into port. An attempt was made at the Infirmary, under chloroform, to reduce it, but failed. Now, in order to continue his business as sailmaker, free movement of the shoulder-joint was essential. Moreover, in heavy weather the sailmaker has to go aloft to take in sail, which would have been quite impossible for him to do with the very limited amount of movement at the shoulder which he possessed. The joint was therefore excised, and at the meeting the movement was seen to be excellent, the patient feeling confident that it would prove sufficient for him to enable him to make his livelihood at his business.

The other two cases were excisions of the elbow-joint. In one instance the patient was a man about thirty years old, who had an unreduced, backward dislocation of the elbow-joint. The result of this was that the joint was deprived of all movement, and was fixed at such an obtuse angle as to render the arm

practically useless. In the other case, a boy of twelve had experienced an oblique fracture of the lower end of the humerus into the elbow-joint. The arm had been placed on a straight splint in the extended position, with the result that it remained in that position quite stiff. In both instances excision had given the patients most useful and movable arms.

Mr Banks mentioned that he had excised the hip twice for unreduced dislocation, the shoulder three times for the same cause, and the elbow several times for unreduced dislocation, or for badly treated fractures of the lower end of the humerus. Excision of a dislocated shoulder is a most laborious and troublesome job, as the humeral head lies very deeply buried, pressing on the axillary vessels and nerves, which may be very easily injured if care is not taken. Having laid bare the great tuberosity and outer surface of the first two or three inches of humerus, the plan is to divide that bone before proceeding further. Mr Banks in his first case divided the bone from within outwards with a chain saw, but in the two others had divided it partially from the outer side with a small saw, and then cracked it through with big bone forceps. The upper fragment of bone should then be seized with powerful forceps, one blade of which should be thrust into the marrow cavity. The head and upper fragment can then be manipulated with great ease, and their muscular and other attachments divided. At the elbow-joint too great caution cannot be exercised in removing the soft parts from the inner side of the joint, as the ulnar nerve is most difficult to find in the abnormal position of the bones.

Mr Banks had long ago recognised the mistake made by the older surgeons in keeping excised joints motionless on splints for considerable periods after operation. He had seen great difficulty arise—especially with the elbow-joint—in getting any motion at all worth while. For many years, therefore, he had never applied any splints after excision of the hip, shoulder, and elbow. On the contrary, from the very day after operation, motion is commenced. The elbow, for instance, is at complete flexion one day, at a right angle the next, and at full

extension the third. As the deep soft tissues gradually close in and draw the ends of the bones together, these ends are adapting themselves to each other, so as to make the best imitation possible, under the circumstances, of the natural joint.

With regard to the amount of bone to be removed, the almost invariable fault was to remove too little, and this especially at the elbow. While this statement held true of excisions for all causes, it was notably true of the operations done for injury, in which the rapid formation of new bone became a positive source of harm, by its tendency to lock the movements of the artificial joint.

The PRESIDENT (Mr PUZEY) brought before the meeting a young man who had recovered perfect movement of the elbow-joint after very severe injuries, including complete division of the biceps just above the tendon; paring of the divided ends and careful suturing having been followed by complete union. This patient, it appeared, had ten years before, when about seventeen years old, sustained a rupture of the urethra, which had been left untreated, the result being that most of the urine was passed through perineal fistulæ. The opportunity was seized of treating the man for this condition as well as his wound. A curious condition of affairs was found (illustrated by diagram); and after the operations, the man was sent home, with a full-gauge urethra and a sound perineum.

March 1, 1894.

Two Cases of Gastro-Enterostomy. By W. MITCHELL BANKS, F.R.C.S., Surgeon to the Royal Infirmary.

IN medical societies and places where they talk, the custom of narrating only success is so universal that I trust I shall not shock the members present to-night too seriously by bringing before their notice two unsuccessful cases. They are cases of cancer of the pylorus, where an attempt was made to produce an artificial opening between the stomach and the jejunum—

gastro-jejunostomy.   The patients were both men well over fifty, who were clearly the victims of pyloric cancer.   The first case was done in private about two years ago, and I am sure Dr Carter will bear me out in saying that the operation was performed solely as a result of strong pressure on the part of the patient, who thoroughly comprehended his position, but who was especially anxious to live a little longer in order to arrange certain business matters.   The second patient also insisted upon having the operation done.   He had heard that stomachs were opened with perfect ease and success; and being a very courageous and determined man, he resolved to run the risk, although the dark side of the picture was put very forcibly before him. I lay some stress on this point, because I know how easy it is to persuade patients to operation nowadays.   The triumphs of surgery have become public property, and people place in us most unbounded confidence, because they think our powers are almost unlimited.

The operation was the same in both cases.   An oblique incision was made parallel to and a little below the left lowest rib cartilages.   The gastro-colic omentum was bored through and a large hole made in it, requiring the ligature of a few vessels.   This enabled me to lay hold of the jejunum without difficulty, and I think this is a better plan than going round the left side of the omentum.   The opening of the jejunum and stomach, and the adaptation of decalcified bone plates, need not be described.   The method pursued was that of Senn, with a little modification in the bone plates.   Both operations were accomplished without the slightest loss of time, and without a hitch.   I was told that, in the second case, from the commencement of chloroform to the final dressing, only fifty minutes elapsed.

Results.—The first patient never rallied from the operation, and died on the following day.   The parts were found to be quite natural.   The stomach and jejunum were in perfect apposition, and there had not been any leakage.   The second patient did very well for about two days, after which a quiet sort of welling-up of greenish-brown fluid took place, unaccompanied by any violent retching or straining.   After this he

slowly sank, and died a week after the operation. The parts are before you. The wound was healthy, and there was no sign of any peritonitis or leaking into the peritoneal cavity. The stomach and jejunum lay in perfect apposition, and the silk threads remained intact. But when they were cut it was found that no adhesive lymph had been thrown out, probably owing to the patient's extreme weakness. The bone plates had disappeared, all but a small portion of one of them.

The chief point which I wish to bring before the Society is the fact that, even with operations conducted perfectly satisfactorily, the human body can only resist a certain amount of shock, and this important point is too apt to be forgotten in performing those serious operations on the abdomen which are now every day attempted. The actual performance of many of them is quite simple. Gastrostomy and gastro-enterostomy can be done by any surgeon of the least experience. A far more difficult point is to estimate the resisting powers of the patient, and only to submit to operation such as seem to have sufficient strength to hold out against the shock of operation. In my two patients I had the remains of fine men, full of courage, and anxious to have anything done. It only shows how seriously such diseases as cancer of any duration sap and undermine the vital powers of the patient. So much is this the case that the operation of gastrostomy, or opening the stomach for cancer of the œsophagus, and feeding the patient through the opening, is one that I do not purpose to do again. I have done four such cases, and the condition of the patients was most melancholy. I intend in future to pass into the œsophagus Symond's tubes, and as long as the patient can get milk down through them, well and good ; and when he can no longer do this, then a morphia syringe will procure a euthanasia. As for removing the pylorus, that is, indeed, a most formidable and difficult operation. After Billroth's celebrated case, I think the most brilliant one yet recorded is that done by Dr Rawdon. I asked him the other day if he knew of another successful one in this country, and he did not. Taking it all round, I am inclined to think that if Billroth's patient had died, the average of human life of patients with pyloric cancer would

have been prolonged.   We know all about the successful cases, but the numbers who have died after operation in Germany and France, and even in England, and have had their lives shortened, will far outweigh the months of extra life gained by the few lucky survivors.

I do not wish for a moment to appear as if wishing to hinder the advance of legitimate surgery, but the constant publication of successful cases, with the equally constant withholding of the unsuccessful ones, has produced in the mind of the general medical public a false idea both of the security to life and of the value of the after-results.   My object is to argue for a very careful selection of patients who have still vital strength left to resist shock, and to deprecate a too universal attack upon all and sundry patients, whose cases may certainly be treated mechanically by laparotomy, according to theory, but who succumb even after the best-managed operative proceedings.

Case of Large Adenoma of the Fauces.   By F. T. PAUL, F.R.C.S., Surgeon to the Liverpool Royal Infirmary.

JANE J., aged 42, was admitted into the Royal Infirmary on July 17th, 1893, under my care, complaining of a tumour the size of a hen's egg at the back of her throat, on the left side. She was in robust health, and had a good family history.   She first discovered the tumour about a year ago, when it was nearly as large as it is now.   It still causes her no pain, and very little inconvenience.   Her doctor treated it for five months without effect, though he several times punctured it with a trochar and canula.   Ultimately he sent her to Liverpool for further advice.

On examining this tumour, it was seen to project into the pharynx from the left side, and was covered with smooth mucous membrane, in which the veins were enlarged.   It had a firm elastic feel, and moved on the subjacent structures.   It was distinctly not infiltrating in character, but rather conveyed to the touch the sensation that it was encapsuled and could be

easily shelled out. Having seen two very similar cases, of both of which I possess microscopical specimens, under the care of my colleagues, Messrs Bickersteth and Mitchell Banks, I decided that this was an encapsuled adenoma, which had probably originated in the left tonsillar region, and, projecting backwards, now occupied the upper half of the left side of the pharynx.

On July 18th the patient was taken to the theatre and placed under the influence of chloroform. A preliminary laryngotomy having been done and the glottis plugged, a vertical incision was made over the tumour through the mucous membrane, and the latter was loosened over its surface with the finger and a blunt dissector. In this way the tissues surrounding the front and lower half of the tumour were readily separated; but above, where it was in connection with the base of the skull, more force was necessary, and whilst dealing with this part the capsule broke, and some of the softer central parts of the growth escaped. Ultimately, however, every bit of the capsule was dissected out, and a smooth-walled cavity left behind, free from every trace of the tumour. There was very little hæmorrhage.

The patient suffered no collapse, and next day could breathe so easily by the mouth that I removed the laryngeal tube. The only treatment adopted was a mouth wash of sanitas. She recovered rapidly, and in ten days left the Infirmary quite well, with a normal-looking throat.

Having been requested to write and inform me as to the state of her health in three months' time, the following letter duly arrived, under date October 18th, 1893 :—" I have great pleasure to be able to inform you that since my discharge from the hospital in July last I have not had the least trouble or pain. My throat is as well as ever it was. I have been examined by two medical men not long ago (who had heard of the case), and they were both satisfied that the operation had been a perfect cure." Then follows this somewhat equivocal observation :— " Thanks to the doctors and nurses, and to the Almighty God I had but a very poor hope of ever going out of hospital alive when I came in.—This from your obliged and humble servant, —JANE J. ANGLESEY."

Adenoma of the fauces or palate is a comparatively rare form of tumour. During the past twenty years, largely owing to the generous help of my surgical friends, an immense number of tumours have come under my observation, but amongst them there are only three specimens of this form of growth. Of one I have no history, but both the others occurred in women about 40 years of age, and were placed on the left side. All three originated in the fauces, in close relationship with the tonsil.

The structure of these growths is characteristic, being remarkably like that of the common adeno-myxoma of the parotid, with the exception that there is a peculiar tendency to the formation of pseudo-pearls—spherical laminated collections of cells and mucus—in the lumen of the imperfect glandular acini, which pointedly suggests an epitheliomatous structure. Nothing, however, could be further from the truth, as these tumours are absolutely innocent.

Mr Stephen Paget, in a paper—the most comprehensive on the subject—contributed to the St Bartholomew's Hospital Reports in 1886, gives a table of thirty cases, collected from all sources. In these cases the tumours originated in the palate, but they are identical with those originating in the fauces. The following are the chief features of the cases recorded by him :— (1) The long duration and innocent nature of the growth. (2) Their oval shape and encapsuled character. (3) Their frequent situation on the left side. (4) They are met with at the same ages as parotid tumours, namely, from puberty to 40 or 50. (5) They occur equally in males and females. (6) Their structure is like parotid adenoma, with the not unusual addition of epithelioma-like pearls, a point also noted by Mr Shattock.

Dr Middlemass Hunt has kindly furnished me with several references to cases published in the special department of laryngology. I need not, however, refer to them in detail, as they are practically uniform with those above quoted.

Case of Laparotomy for Intestinal Obstruction. By F. T. PAUL,
F.R.C.S., Surgeon to the Liverpool Royal Infirmary.

THE following case I attended in consultation with Drs William
Evans and Barron, and I am indebted to the former for most of
the notes.
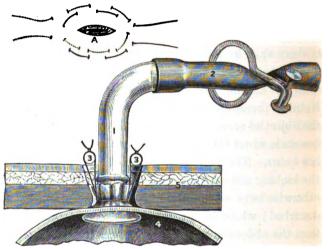
Mr J. K., aged 22, has been known to Dr Evans, as the family
medical adviser, for the last seven years. He is of robust consti-
tution, and has had no serious illness during this period. His
family history also is good.

On November 26th he called on Dr Evans, complaining of a
severe pain in the abdomen. He described it as of a grinding
and twisting character, not localised, and coming on in paroxysms.
Had taken castor-oil that morning, having been constipated for
a few days previously. Three days ago he had some rounds at
boxing, and received several blows in the abdomen. Had also
been doing some gymnastic tricks on the evening of the 25th,
and had then felt a sharp pain in the right groin, but it passed
away. Dr Evans at once sent him to bed, put him on slop diet,
and ordered him sedatives. November 27th.—Patient passed a
bad night. Careful examination of the abdomen revealed nothing
abnormal. The attacks of colic recurred every ten or fifteen
minutes, so the sedatives were increased. 28th.—Condition the
same; slept badly, but passed a small motion. Continued in
much the same state for about a week, during which the bowels
were moved two or three times, and he passed wind freely. Then
he appeared to be improving; the paroxysms of pain were less fre-
quent and severe, and he was kept fairly comfortable by the use
of a small hypodermic injection of morphia twice during the night.

On December 6th a simple enema was given, and he passed a
great quantity of fæces. The next day he had a small natural
motion, and felt much better; went downstairs, and, against
orders, indulged in a mutton-chop. December 8th.—Was worse
than ever, and the utmost care was again adopted. In two or
three days he began to get distended, and from the 10th or 11th
the obstruction was complete, though the symptoms were kept
under by careful dieting and the use of sedatives.

On December 15th I first saw the patient in consultation. The obstruction had now been complete for about five days, and the abdomen was greatly and tensely distended. He was much distressed, respiration embarrassed, pulse quick and thready, tongue dry, vomiting green, but not fæcal matter; nor had he that collapsed, done-up appearance which is commonly associated with a late stage of internal strangulation. I quickly came to the conclusion that his intestinal obstruction was due to kinking of the bowels, owing to localised peritonitis, which was probably in the neighbourhood of the cæcum, but whether due to appendicitis or some other cause there was nothing to show. I recommended that an operation should be undertaken, as it was evident that he had not many days to live in his present condition; and when once great distention has taken place in these cases of kinking, there is but very little chance of relief by Nature's processes. In such cases as these, any operation having the object of searching for and undoing the adherent and kinked bowels is worse than useless, and is almost sure to be fatal in a few hours. The peritoneal adhesions which have brought about the kinking generally, conceal and localise matters which would otherwise have set up fatal septic peritonitis, and should not be disturbed; whilst bowels distended as these were, once removed from the abdomen, cannot be restored to their natural position until they have been emptied of their contents. Fortunately, all that is called for in this class of obstruction is a simple and easy operation, which will in all probability be successful if the diagnosis has been correct—that the case is one of obstruction without strangulation. The object of the operation should be to drain the intestines of their contents, and I have on former occasions suggested a method of doing this, which, with reasonable care, seems to be almost devoid of danger. The method consists in inserting a glass tube into the bowel, after the manner shown in the accompanying diagram, and described in the last volume of the *Journal*, page 257. As the distention is relieved, the kinks cease to obstruct; and as the inflamed and paralysed part of the bowel regains its normal tone, it becomes almost, if not altogether, as efficient as it was before.

The following day, December 16th, I opened the abdomen, with the assistance of Drs Barron and Evans. Through a small incision in the middle line below the umbilicus, a distended coil of intestine was withdrawn, and one of my small-sized intestinal drainage-tubes inserted. The coil soon collapsed, but unfortunately did not relieve any others. It was kinked at both ends. Under these circumstances, there was nothing for it but to tap another coil; and one had the choice of either leaving two drainage-tubes *in situ*, or of removing the first and sewing up the opening

A. Method of passing the ligatures in the stomach. 1. Glass tube. 2. Rubber tube with clip. 3, 3. Sectional view of glass rods over which the ligatures are tied. 4. Interior of the bowel. 5. Abdominal wall.

in the bowel. The former plan I believed to be the safer, and certainly the more expeditious, and therefore at once adopted it. The second opening proved to be a more lucky hit, and at once relieved the general distention, a large quantity of gas and thin yellow fæces flowing through the tube into a basin. The result being now quite satisfactory, the tubes were fixed as is shown in the diagram, by simply tying their ligatures over glass rods crossing the wound, and the latter was closed with three fishing-gut sutures.

The duration of an operation like this is to be counted by minutes in place of hours, and the relief given by it is immediate;

hence, when no strangulation is present, the prognosis is good, and the patient may be expected to make a rapid and complete recovery. This was the case with Mr K. Within three weeks he was ,up and fairly well again, and what suffering he had in the meantime was not connected with his abdomen, but the outcome of the wild life he had led just previous to his illness. The glass tubes held for four days, when the upper one had to be removed. On the fifth day the lower one was also loose, and had to be taken out. On the third day he passed flatus freely, and had a slight natural movement of the bowels. A few days later an olive-oil enema was given, which brought away a quantity of scybalous fæces. As the natural passage was restored, fæces ceased to pass by the wound, which rapidly closed, and at the end of a fortnight only a little flatus occasionally escaped. Even this soon ceased, and he has since been completely restored to health. The bowels move naturally, and he undertakes considerable exertion without in any way suffering: indeed, within six weeks of the operation he took a walk of fifteen miles without unusual fatigue.

March 29, 1894.

MR ROBERT JONES related a case where he operated for intestinal obstruction, the obstruction having lasted twelve days. There was considerable distention, but a median incision was made, and the cæcum found collapsed. He also felt empty small intestine in the pelvis. The obstruction was placed in the shape of a band about three-quarters of an inch broad, which compressed the ileum, producing complete blockage. The strand was severed, and fæcal vomiting, which had been constant up to the operation, quite ceased, and the patient rapidly convalesced.

Mr Robert Jones also related a case of hydatid of the liver, which he incised, and stitched by a double row of sutures to the abdominal wall. He removed 120 ounces of fluid. The patient recovered.

April 12, 1894.

DR BRIGGS mentioned a case of prolapsus uteri, with a large phosphatic vesical calculus.

The patient was 35 years of age, and a cook in domestic service.

The uterine prolapse had been known for five years (ten years after the birth of her only child). Formerly she could wear a watch-spring pessary with comfort and relief; latterly, since August 1893, a pessary had increased the pain.

An anterior elytrorraphy and a colpo-perinæorraphy were performed for the relief of the prolapsus; three weeks afterwards the bladder symptoms still persisted; the bladder was examined, and a phosphatic calculus of considerable size was found. The calculus was too large for removal per-urethram without the risk of permanently damaging the sphincter. A longitudinal incision was made in the vesico-vaginal septum; the calculus was removed through the incision, and the bladder drained by a glass tube, per-urethram, for twelve days; the septum healed completely, and left a fine linear cicatrix.

In reply, Dr Briggs explained that he had no intention of advocating incision of the septum in preference to lithotrity in suitable cases. He had not arranged to crush the calculus, because he feared a foreign body was the nucleus of the stone. He quite agreed with the general preference for lithotrity.

Œsophagotomy for a Tooth Plate. By Mr ARTHUR H. WILSON, Surgeon, Liverpool Northern Hospital.

THE patient, J. H., æt. 65, was admitted into the Northern Hospital at 5 A.M. on Jan. 27th, said to have some false teeth impacted in his pharynx. Two or three hours previously he was heard coughing violently, and, upon some one going to him, was found sitting up in bed, breathing noisily; he said he had swallowed his teeth while asleep. As domestic remedies were of no avail, Dr Samuels was sent for, and advised his removal to hospital. Upon admission, Dr Coope, the senior house-surgeon, was able to seize the plate with a curved forceps, but could not make it move. When I saw him, with the

president, at noon, he was lying on his right side, breathing with some difficulty, and unable to breathe on his back. The neck was slightly swollen, and so tender, especially on the left side, that it was impossible to examine him. On admission he had been able to drink a little, but now very little, if any, could be swallowed. The patient looked even more than his age, but his general condition seemed very fair, and his pulse was good. He was, however, very nervous and restless.

A.C.E. was given, and an attempt made to remove the obstruction. The foreign body could now be felt from the outside, though without clear definition, lying in an oblique position, slanting downwards from left to right—the upper part being about the level of the crico-thyroid membrane. Small bougies would go past it, but larger ones were at once arrested. Forceps of various kinds seized it, but not very firmly; and, after a prolonged attempt, it was abandoned, and we decided to operate.

The ordinary incision was made for œsophagotomy on the left side, slightly anterior to the border of the sterno-mastoid. The omo-hyoid was easily found and drawn forwards, and the great vessels backwards, while a pair of curved forceps was passed from the mouth, and the point cut down upon. The blades were then separated to enlarge the wound, the finger introduced, and the plate felt. Extraction was a matter of much difficulty, even when the wound was enlarged. The body would turn about freely but would not come out, in whatever direction traction was used. Then a lithotomy scoop was passed in, and an attempt made to lift it out, but this failed. Finally, by means of retractors and enlarging the wound it was possible to look under the plate, and the bright gold clip was seen firmly fixed into the posterior wall of the œsophagus. This was freed with dissecting forceps, and the plate easily came out. The wound in the œsophagus was not sutured, as there was a good deal of bruising to the edges. There was practically no bleeding, only one small artery requiring ligature, but several large veins were ligatured in two places and divided between. A soft rubber tube was passed into the stomach from the wound, and the other end

then seized with forceps and drawn into the mouth. He rallied
from the operation pretty well, but his breathing was very
laboured and his restlessness great. The stomach was washed
out with a little warm boracic lotion, and he was fed regularly.
On the second day his condition was much the same, but the
tongue and mouth were very dry, and a quantity of sticky
mucus collected and was with difficulty got rid of, while
the respirations never fell below 22, and the breathing was
laboured. On the third day he was extremely restless, and
constantly tried to remove his tube. There were no signs
of pneumonia, but the breathing was more rapid, averaging
about 32. He vomited a little during the day. In the
evening it was decided to remove his tube, but the expected
relief did not follow, and he gradually grew weaker, dying
on the fourth day. The wound looked fairly healthy all the time,
but a little vomited matter passed over it on one or two
occasions. The tooth-plate is composed of vulcanised rubber
and contains four teeth. It has two sharp hooks for fixing
the plate to other teeth and has been broken, being sutured
together by thread. Its longest diameter is about 1¾ inches,
and the posterior margin, blackened on the inner side, shows it
did not fit closely to the roof of the mouth. It certainly
seems reckless to have slept with such a damaged article in the
mouth. One of the most interesting points in these cases
seems to me to arise with reference to the after-treatment, and
in this particular case to the cause of the rapid breathing:
Should a tube be used or not? If used, should it be passed
by the wound, mouth, or nose? Although the facilities for
feeding, and so maintaining the patient's strength, are obviously
very great with the tube, and although the wound is kept
fairly free from food, still I am inclined to think that in
passing it from the mouth it helped to increase the restlessness,
caused irritation of the larynx, and kept the tongue and
mouth dry. It is possible that, before operation, the second
hook, which is almost straight, and pointed towards the back of
the larynx, may have produced some injury to it, and so account
for the rapid breathing not being relieved and for the secretion

of mucus; or there may have been some irritation or actual injury to the nerve supply. Two other cases of œsophagotomy for tooth-plates have come under my notice. Both were under the care of Mr Bickersteth when I was a junior student, and I have his permission to allude to them. The one—a healthy policeman in the prime of life—was operated upon shortly after the accident: the plate removed, and recovery followed. The second case was an aged woman, and contains a point of great interest. As far as I remember, the plate had been fixed for some days and very low down, from which position it was removed with difficulty, and the patient died some days after of septic pneumonia. At the post-mortem it was found that ulceration had taken place into the trachea, and that food had passed through this hole, entered the lungs, and so caused death. In neither of these cases was a tube left in, but it was regularly passed for the purpose of feeding. Had the condition existing in the second case been known, probably it would have been wiser to have inserted a tube at the time of operation.

Pathological Specimens.

March 8, 1894.

Tubercular Ulceration of Tongue. By W. THELWALL THOMAS, F.R.C.S.

SPECIMENS of miliary tubercle removed from two cases:—

(1) Woman, æt. 60, was admitted into the Southern Hospital, under the care of Dr W. Williams, suffering from cirrhosis of the liver and ascites. Some weeks after admission she complained of pain in the right side of the tongue. A small ulcer was found there, opposite a jagged second molar (lower); the edges of the sore were not indurated, and, notwithstanding mouth washes, the ulcer extended, spreading along the under

surface of the tongue, and at the same time deepening. The glands on the neck became enlarged one month after the ulcer was first noticed.

Dr Robert Jones removed the tongue and glands. The glands, on section, displayed caseating and suppurating points.

Microscopically.—Miliary tubercle in the tongue and glands. No evidence of epithelioma.

(2) Robert H., æt. 60, sent by Dr Price, Bala, in February, on account of an indolent sore of the tongue.

Three months previously a small blister formed on the tip of the tongue, he thought from irritation by a rough upper incisor (his only tooth in front).

A sore was the result, which increased very slowly, but caused great pain.

When seen (February) the ulcer was the size of a sixpence, at the extreme tip of the tongue; edges slightly thickened, the base concave, indurated, and occupied by a thin greyish slough, through which peeped here and there a few reddish points (granulations). Two thickened ridges of inflamed mucous membrane covered the ranine veins. Scrapings showed only pus. Lymphatic glands not enlarged.

Family history.—He is the sole survivor of a family of seven. The others all died of consumption when about 20 years of age.

His son, æt. 20, died last year of consumption. On examination, his left lung, at the apex, has a cavity, with attendant crepitations.

Operation.—A V-piece was removed, including the ulcer; the gap closed by silkworm sutures.

He returned home in ten days.

Microscopically.—Miliary tubercle throughout.

Polyp of Rectum.

REMOVED from a man æt. 56.

He knew of its existence for some months, on account of its protrusion during defæcation, but it caused no pain. It was the

size of a raspberry, and had a pedicle which was attached three-fourths of an inch up the rectum. It was exhibited to show the "mutability of epithelium" from the original columnar to stratified pavement, from irritation. The superficial cells are flattened and horny.

Sections of Necrotic Tissue from a Carbuncle.

THE carbuncle, of large size, 5 inches by 4, was excised from a man's back before any sinuses had formed. On section, spots of necrotic tissue and pus were found; in the pus, organisms were numerous, occurring in groups of four (tetragonous), and staphylococci.

No streptococci present.

The necrotic tissue would not take logwood stain.

In three weeks the large gap left by the operation had healed.

April 5, 1894.

(1.) Hæmorrhoids and Mucous Membrane, removed by Whitehead's Operation. By W. THELWALL THOMAS, F.R.C.S.

THE ring of tissue displayed three large internal piles, the mucous membrane over them puckered and much thickened.

Removed from a policeman, æt. 48, who was a "martyr to piles" for twenty-three years; a large number protruded on bearing down, with much loose mucous membrane.

(2.) *Vas aberrans of epididymis dissected out of the right scrotum during the radical cure of hydrocele.* The hydrocele extended to the internal abdominal ring, and projecting from its posterior wall was a thick irregular ridge extending to the top end of the hydrocele cavity, where it ended in a pointed extremity. It was almost surrounded by the tunica, and its hardness suggested for a moment the vas deferens. The lower end disappeared behind and between the vas deferens and globus major. The

parietal tunica vaginalis was dissected out, taking the structure with it, from an obstinate case of hydrocele in J. W., æt. 25, which had been once tapped, twelve months previously, then opened six months later, a portion of the sac wall cut away, and the cavity stuffed with cyanide gauze. In six months it recurred, forming an irregular hour-glass hydrocele, the constriction due to adhesions from the previous operation.

Section.—A portion was cut off the lower end for microscopical purposes. The section measures 8 mm. by 2 mm., and presents a large number of tubules cut in all directions (indication of tortuosity), lined by short columnar epithelium, with well-marked nuclei. The tubules number forty in one section.

From its position and similarity to the epididymis on section, it appears to be a highly convoluted vas aberrans, due to the persistence of Wolffian tubules.

The specimen is preserved in the Pathological Museum of University College, Liverpool.

(3.) *Fibromatous Growth removed from Left Labium Majus.*

THE growth, circular in form, 5 inches in diameter, and an inch thick, covered by thin skin, ulcerated in places, dangled at the end of a pedicle 4 inches long and three-quarters of an inch in diameter. The pedicle was attached abruptly to the tumour like the stalk of a mushroom to its head.

The growth was removed, March 31, from a girl æt. 24, in whom it commenced as a small wart twelve months previously. The pedicle was very vascular.

A Method of Making a Permanent Dry Preparation of the Brain. By ALFRED W. CAMPBELL, M.D., Pathologist, Lancashire County Asylum, Rainhill.

THE following method, which, so far as I am aware, has not yet received publication, can be recommended, if a lasting dry preparation of the brain, either for exhibition in a museum, or for demonstration purposes, be required. It should prove especially

useful for the latter, since it may be freely handled, and may further be painted with the usual mixture of oil colour, turpentine, and gold size. I employ it as a substitute for the method of Giacomini, to which process I find it superior, insomuch as it occasions less shrinkage and discoloration of the organ.

1. As soon as possible, after removal from the cranial cavity, the brain is stripped of its membranes, and placed in a saturated solution of perchloride of mercury (7½ per cent.), care being taken to avoid distortion of its configuration. In this solution it is allowed to remain for forty-eight hours, at the end of which time its shape will be fixed.

2. Wash in water, and then harden in methylated spirit for from three to five weeks. (It is better that the spirit be changed two or three times during this period.)

3. When quite firm, immerse in oil of turpentine, and place for three days in an incubator heated up to 45 degrees Cent.

4. Change into melted Cambridge soft paraffin, and allow to remain in the incubator just above the melting-point of the paraffin for from four to five days.

5. Extract, cool in water, clean away all paraffin from the surface and sulci of the preparation, and finally apply a thick coat of spirit varnish.

It will be observed that the treatment adopted is similar to that which one would employ in the preparation of a specimen for section on the Cambridge rocking microtome.

Cirrhosis of Liver—cause unknown. Thrombosis of Vena Portalis. From the Pathological Laboratory of the Lancashire County Asylum, Rainhill. By ALFRED W. CAMPBELL, M.D., Pathologist.

THE liver placed on the table this evening provides us with an example of spontaneous chronic interstitial hepatitis. The

patient, a female, was a subject of enforced temperance, having been an asylum inmate for from twenty to thirty years, and therefore the possibility of alcoholic excess, as a morbid factor in this case, is absolutely negatived. It can also be definitely stated that poisoning with cantharides, phosphorus poisoning, and other known producers of cirrhosis, did not come into operation. When fresh the organ weighed 49 ounces, and, as you notice, the specimen presents the typical features of an advanced " hobnail " liver ; microscopically, also, all the classical changes are observable. Further, the portal vein at its entry into the liver, and for some distance downwards,—viz., the point of entry of its last tributary,—is occluded by a firm white thrombus. Clotting has evidently occurred here in consequence of the obstruction and stagnation in the intra-hepatic portal capillaries. The combined acute and chronic portal obstruction had occasioned congestion and enlargement of all the abdominal organs (the spleen was particularly enlarged, scaling 27 ounces), as well as ascites and some slight jaundice. The secondary channels for the conduction of the portal blood were hugely dilated, the submucous veins at the cardiac end of the œsophagus especially so. Though no actual rupture could be determined, yet it is more than likely that some severe attacks of hæmate-mesis, which occurred before death, were due to bursting of one or more of these vessels, subsequent to the thrombosis of the portal trunk.

A Case of Tubercle of the Brain. From the Pathological Laboratory of the Lancashire County Asylum, Rainhill. By ALFRED W. CAMPBELL, M.D., Pathologist.

THE microscopical specimens shown were taken from the brain of a female who died of acute pulmonary tuberculosis, superseding an unresolved right apical lobar pneumonia. The intestines were extensively ulcerated, but, with the exception of enlarge-ment, &c., of the lymphatic glands, no other macroscopic tuber-cular lesion was discovered in the remaining thoracic and abdominal organs. On carefully inspecting the surface of the

brain, after removal of the pia-arachnoid membrane, one observed five or six small foci of disease. These were not confined to any particular segment of the brain, and in some cases were found in the sulci, in others on the convexity of the convolutions. On section, they were circular in form; their size varied between that of a millet seed and a small pea. They chiefly occupied the cortex, but the white matter in the case of the larger ones was also invaded, and they consisted of a soft, caseated, yellow centre, surrounded by an apparent zone of congestion. In the microscopical sections made by the fresh method, and tinted with aniline blue-black, the focus of disease has stained intensely, and thereby the position of the growth is clearly indicated. Fringing the blurred caseous centre, numerous blood-vessels, with irregularly-thickened cellular walls, are seen, and in their proximity are to be observed many spider cells, possessing large bodies, but comparatively few processes. The pia mater covering the growth is also thickened and cellular, and it seems likely that it was in this membrane that the original deposit of tubercle occurred. A cover-glass preparation of one of the caseous centres, stained for tubercle bacilli, is also shown, and reveals the presence of a multitude of these organisms.

Rupture of the Liver.   Shown at the Medical Institution by
ARTHUR H. WILSON.

THE patient, G. B., æt. 35, a carter, was admitted into the Northern Hospital on November 15, 1893, with a history of being crushed, in the upper abdominal region, between his lorry and the wall. He was very collapsed, the face being of an ashy-grey colour, and lips intensely pale. He was perfectly conscious, rather excited in his manner, and restless. He lay chiefly on his right side, resting on his elbow; abdomen rigid; breathing rapid and entirely thoracic; pulse very rapid and feeble; temperature subnormal. At times he was free from pain, but had occasional severe spasms. There was dulness over both flanks. He appeared to be dying, but in the evening rallied a little. His symptoms remained without much change, but with a

tendency to improvement, until Nov. 20th, when diarrhœa came
on, and he died suddenly while using the bed-slipper.

Post-mortem examination showed rupture of the liver, the
whole of the quadrate lobe being torn off and lying in the
abdominal cavity, quite loose, except for a small peritoneal band.
There was no other lesion beyond slight bruising of the upper
end of the right kidney. All the viscera were pale, and the
abdomen was full of thin fluid blood and clots.

The case seems worthy of briefly noting because of the unusual
nature of the injury, such a large piece of the organ being
detached, while the remainder showed no signs of the accident,
and also for the length of time (five days and some hours) the
patient survived.

Purpura Hæmorrhagica Neonatorum.   By J. R. Logan, M.B.,
     Senior-Assistant Physician, Liverpool Infirmary for
     Children.

It is said that newly-born infants are liable to hæmorrhages
of various kinds. Apart from injury or accident, asphyxia or
convulsions, however, I think we may safely say that, what
may clinically be called as *spontaneous* hæmorrhages are
decidedly rare. Such cases include gastro-intestinal hæmor-
rhage, hæmorrhage from the rectum and female genital organs,
hæmorrhage in cases of acute fatty degenerations, in epidemic
hæmoglobinuria, and in the condition which gives the title
to this note.

I have now seen three cases which have had in common
the feature of disseminated hæmorrhages beneath the skin.

The first was under my care in Edinburgh fifteen years ago.
The infant was delicate from birth. About the third day
bleeding took place from the cord, which was consequently
re-ligatured. After the separation of the cord there was
repeated and considerable oozing of blood from the umbilicus,
which persisted for nearly a week in spite of a variety of
hæmostatic expedients. At the end of that time it was finally
arrested by means of a pad of lint soaked in the strong solu-

tion of the perchloride of iron. Soon thereafter there were hæmorrhages into and under the skin in several parts of the body, under the mucous membrane of the mouth, and under the conjunctiva. The child now became jaundiced, and died when about a fortnight old. So far as I can remember, there was no cyanosis. In filling up the certificate I stated that hæmophilia was, to the best of my knowledge and belief, the cause of death ; but I have no doubt now that it was an example of a disease described by Buhl upwards of thirty years ago, in which there are the external manifestations above enumerated, together with cyanosis as a rule, and acute fatty degeneration of the liver, kidney, heart, &c., found on post-mortem examination.

The second case was brought to me on one occasion only at the Infirmary for Children. The child was considerably jaundiced, and there were several extravasations under the skin, but so far there had been no umbilical bleeding. The child was about 10 days old. This case probably belonged to the same category as the former.

The third case occurred in November 1893. The mother was attended in her confinement by a midwife, who says that the labour was normal, and the baby a fine female child, in every way satisfactory up to the morning of the ninth day. The cord separated on the fourth·day, and I am informed that the navel was dry and healthy. On the morning of the ninth day the nurse noticed what appeared to be a bruise under the left collar-bone, and suspected ill-treatment. On the morning of the tenth day a similar mark was noticed at the left elbow. That night hæmorrhage from the umbilicus began, and, in spite of a pad applied by the nurse, continued more or less all through the night. Next morning my friend Dr Smart was sent for, but he being unable to go, I attended the child. On visiting, I found evidences of great hæmorrhage in the shape of soiled clothes, and in an extremely blanched condition of the child's skin and lips. I also saw several subcutaneous extravasations. The pulse was almost imperceptible, and the child was greatly collapsed. There was no jaundice. A pad of lint soaked in

strong perchloride of iron was applied, but did little good, its effect being somewhat diminished by the action of the attendants, who, in their anxiety, removed the pad from time to time to see how matters were getting on. The child died about noon, two days and a half after the first extravasation was noticed.

At the post-mortem examination we found subcutaneous extravasations on the chest, limbs, and back, the external discoloration varying in size from that of a threepenny-piece to that of a shilling.

The skin near the umbilicus was blood-stained. The thorax and abdomen were opened. The heart was normal, and so were the lungs and pleuræ, with the exception of a slight sub-pleural ecchymosis between the lobes of one lung. With the liver nothing whatever was found amiss, and all the other abdominal organs appeared healthy, but one of the kidneys was found, on section, to contain a hæmorrhage which, at its largest, was nearly as broad as a threepenny-piece. The extravasated blood invaded the cortex and medulla, especially the latter. It broke down in the centre, but at its periphery blended with the renal tissue. The liver, kidneys, spleen, and lungs, also the skin and subcutaneous tissue, corresponding to an ecchymosis, were examined microscopically, with the following result : The liver tissue was absolutely normal. There was no trace of fatty degeneration. The renal parenchyma was perfectly healthy, with the exception, perhaps, of the convoluted tubules, whose epithelium was rather granular, and took up stains rather badly. The extravasated blood referred to had probably escaped from one of the vasa recta, and, in addition to forming a clot, dissected its way between the tubuli recti, and for a little distance between the cortical tubes. The spleen and lung were normal.

The chief part of the blood in the *ecchymosis*, seen through the skin, was in the subcutaneous tissue, but a small quantity had forced its way into the dermis and right up to the epithelial layers.

The liver and kidney were carefully stained for microbes by several methods. I have not been able to satisfy myself

of the existence of any such in the former, but I found quite a number of blocks composed of masses of micro-cocci in the vasa recti. In the renal hæmorrhage also I found a few single microbes, and also several white cells crowded with micro-cocci.

The day after the post-mortem a number of tubes and bottles containing nutrient jelly were infected, some with blood, others with spleen pulp, but in no case was there any growth.

These conditions are obviously very rare, and more so in our own country than in America and on the Continent.

Benjamin West, however, has repeatedly observed the con-currence of jaundice, umbilical hæmorrhage, and subcutaneous extravasation, and is of opinion that the usual cause is occlusion of the bile ducts, but admits that although he has seen such in some, in others the bile passages were normal.

In Eustace Smith's *Disease in Children* there is no reference to the conditions present in my cases, nor do Ashby and Wright appear to have met any examples. They, however, allude to the two following diseases (*a*) described by Buhl in 1861, in which infants, usually somewhat cyanotic, exhibit jaundice, with umbilical, subcutaneous, and mucous hæmorrhages during life, and fatty degeneration of the kidney, liver, and heart at the autopsy ; (*b*) a similar condition described by Winkle of Dresden and Bigelow of America, in which hæmoglobinuria was also present. These latter cases have been epidemic in insanitary lying-in hospitals.

The only authority I have found who has given a fairly clear account of a condition similar to my last case is Vogel of Dorpat, Russia, who enumerates all the signs and symptoms, but refers to the cutaneous extravasations as petechiæ, which I could scarcely call them. He states that the condition is very rare, and estimates its frequency as once in 10,000 cases. He is inclined to the opinion that it is hæmophilia, and states that the *grandfather* of his patient was a bleeder.

I therefore conclude that there are two distinct diseases— the general fatty degeneration, and what may conveniently

be described as purpura hæmorrhagica neonatorum. My opinion of the nature of the case is that it is an infective disease, to be classed along with septicæmia and tetanus, that the microbes find entrance at the umbilicus, and collecting in masses in the capillaries cause necrosis at these spots, with consequent extravasation of blood.

Efficient treatment would be preventive, and consist in cleanliness of the navel.

New Drugs.

MESSRS PARKE, DAVIS, & CO. have supplied us with samples of some of their newer preparations, which, as elegant pharmaceutical products, are all that could be desired. We may briefly notice the following. Their soda and mint tablets are composed of pure bicarbonate of soda and peppermint, without any ammonia, and consequently they are more palatable than those usually sold. *Ophthalmic Tablets.*—They have introduced soluble ophthalmic tablets of those drugs commonly employed in locally treating diseases of the eye. One of these tablets can be readily dissolved in the necessary amount of water in a graduated stoppered bottle with dropper, which they provide, and thus the medicament is ready for use. Their soluble hypodermic tablets are very convenient and thoroughly reliable. A similar recommendation may be given to their antiseptic nasal tablets. Their fluid extract of pichi is highly extolled in cystitis, and is certainly worthy of a trial. Their price-list and other information can be obtained at the London depot, 21 North Audley Street, W.

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